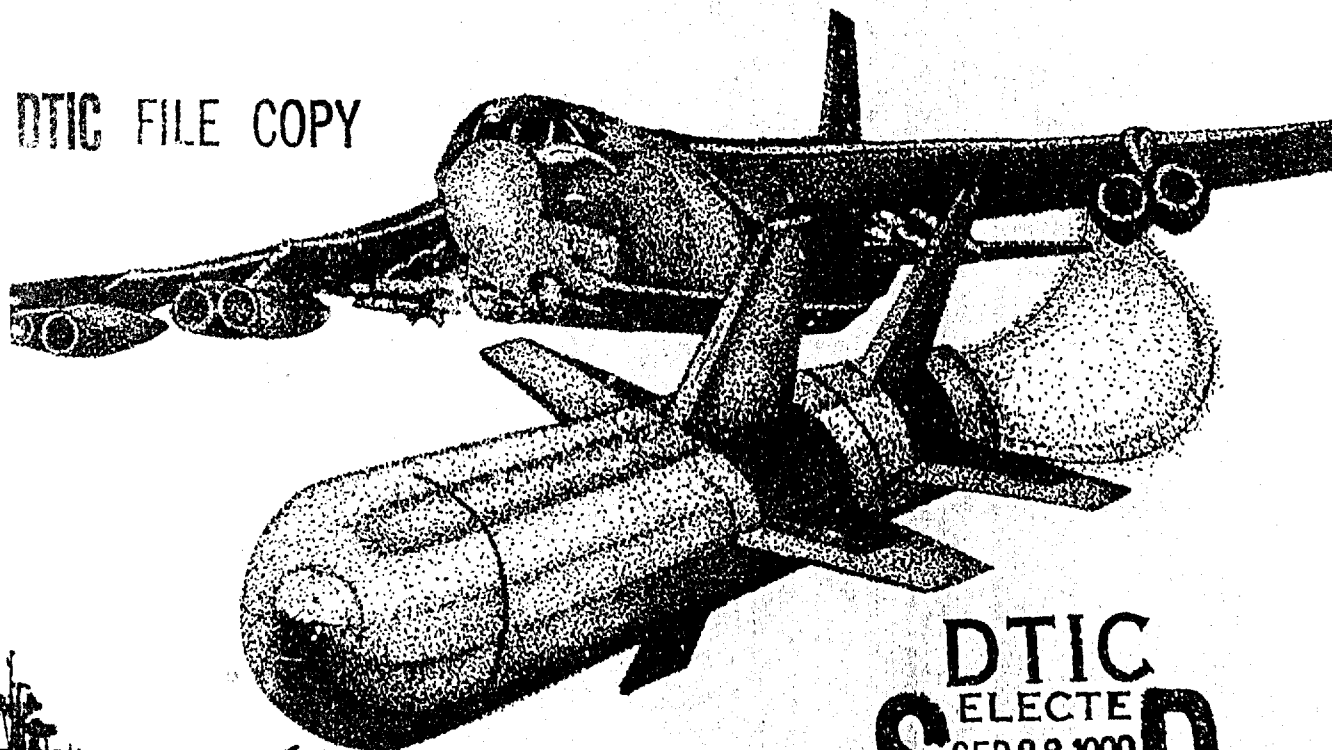
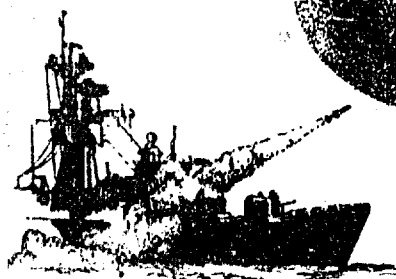


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## COMMAND AND CONTROL OF JOINT ANTISHIP OPERATIONS

LT COL ROBERT C. KUHLO

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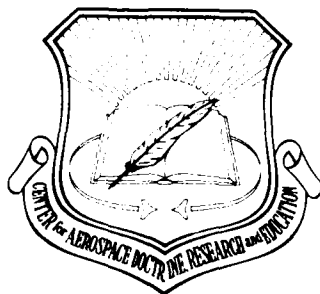
## **Attacking Ships**

### ***Command and Control of Joint Antiship Operations***

**Kuhlo**

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Thank you for your assistance



Research Report No. AU-ARI-89-3

# **Attacking Ships**

## ***Command and Control of Joint Antiship Operations***

*by*

**ROBERT C. KUHLO, Lt Col, USAF**  
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Airpower Research Institute

**Air University Press**  
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October 1990

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## ***Foreword***

The US Air Force and the US Navy have long histories in maritime aviation operations. In 1910 the Navy was launching aircraft from ships and by 1923 had launched its first aircraft carrier. During World War I aircraft flew maritime patrols and conducted antisubmarine operations. In 1921 Gen. William ("Billy") Mitchell, an early proponent of air power, demonstrated the effectiveness of aircraft in antiship operations by sinking three battleships at sea. During World War II the Air Force and the Navy developed a joint maritime war-fighting capability that was decisive in the Pacific. Unfortunately, this joint capability withered as the services went their separate ways following the war. However, in the last 10 years, the Air Force and the Navy have actively developed joint maritime capabilities.

Strategic Air Command B-52s routinely conduct sea surveillance, aerial mine laying, and Harpoon antiship operations, with aircraft recently dedicated to conventional nonnuclear missions. Tactical forces conduct joint maritime operations with the E-3 providing airborne warning and control and a variety of fighters involved in counterair and other missions in the maritime environment. The F-16, armed with Harpoon missiles, will soon provide the latest joint antiship capability.

An important aspect of joint Air Force and Navy operations is command and control. This research report investigates command and control doctrine of the Air Force, Navy, and Joint Chiefs of Staff and contrasts how the Air Force and the Navy implement this doctrine. The conclusions and recommendations section contains a thought-provoking analysis of the current situation and have application across the spectrum of joint operations. This report is recommended reading for all joint maritime planners.



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Deputy Chief of Staff for Operations  
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## ***About the Author***



**Lt Col Robert C. Kuhlo**

Lt Col Robert C. Kuhlo graduated from the University of Tennessee in 1967 and was commissioned through the Air Force Reserve Officer Training Corps. After completing pilot training at Craig AFB, Alabama, where he received his officer training award, he became an aircraft commander of the RF-4C, flying tactical reconnaissance from Kadena AB, Okinawa; Tan Son Nhut AB, South Vietnam; Ramstein AB, West Germany; and Zweibrücken AB, West Germany. After a tour at Zweibrücken as a command post controller while flying T-39 operations support airlift, he continued as assistant wing operations plans officer. Broadening his background in joint operations, Colonel Kuhlo served as the reconnaissance liaison officer to V Corps, Frankfurt, West Germany. Returning to the RF-4C in 1982, he served two years as assistant operations officer and training officer in the 91st Tactical Reconnaissance Squadron, Bergstrom AFB, Texas. From 1984 to 1988, Colonel Kuhlo was assigned to the Fifth Air Force, directing the United States Pacific Command peacetime aerial reconnaissance program, exercises, and bilateral planning with the Japanese Self-Defense Forces. A graduate of the Air War College seminar program and the National Security Management correspondence program, Colonel Kuhlo holds a master's degree in human resource management and in international relations. Following his assignment as the Pacific Air Forces research fellow at the Airpower Research Institute, Colonel Kuhlo became chief, Combat Employment Studies of the Combined Air Warfare Course, Combat Employment Institute, Center for Aerospace Doctrine, Research, and Education, Maxwell Air Force Base, Alabama.

## ***Acknowledgments***

Air Force officers seldom have the opportunity to sit back and think great thoughts or look into matters beyond the boundaries of their current jobs. This year, as a research fellow, I had the rare opportunity to dig into multiservice doctrine and maritime operations to a degree that otherwise would have been impossible. For this opportunity I would like to thank Maj Gen James E. Chambers, Pacific Air Forces deputy chief of staff for operations, who selected me as the Pacific Air Forces research fellow and supported my research visits to various headquarters. I also wish smooth sailing to Comdr Eric Briggs of Cruiser-Destroyer Group Eight, who showed me "the Navy way" aboard the USS *Roosevelt*.

At the Airpower Research Institute, Lt Col Manfred Koczur provided moral support when things got slow. My advisers, Dr Lawrence E. Grinter and Dr Richard Bailey, kept me straight with suggestions about content and format, as well as thorough proofreading.

Last, I must thank my wife, Mary Nell, who sacrificed her job, career, and retirement, and our cat, Big Boy, who suffered the traumas of traveling and conquering a new domain.

## ***Introduction***

Picture this scenario: The enemy fleet is arrayed in battle formation to defend its mainland from attack. Lines of radar picket ships, protected by guided missile cruisers, provide early warning to enemy airfields, denying surprise to the attacking forces. Neither the Navy nor the Air Force can marshal adequate forces to neutralize the defenses and still mount an effective attack, so they go it together. An Air Force E-3 airborne warning and control aircraft coordinates the battle and provides last-minute target updates to inbound B-52 and P-3 aircraft carrying Harpoon antiship missiles. Navy EA-6B aircraft jam enemy radars to cover the approach of Air Force F-4G Wild Weasel aircraft. Suddenly the Wild Weasels fire high-speed antiradiation missiles, destroying the radar antennae on the enemy cruisers. With their long-range missile guidance systems destroyed, the cruisers can no longer protect the other ships. Harpoon antiship missiles cripple the defenseless cruisers and other support ships. Navy F/A-18s and Air Force F-16s attack the picket ships with precision-guided munitions, opening a 100-mile gap in the enemy's radar coverage. Through this gap races wave after wave of Air Force and Navy fighters, descending undetected and without warning on the enemy's naval aviation and long-range bomber bases. In two hours the joint Air Force and Navy operation successfully destroys the enemy's seaborne early warning and air defense system and wipes out the long-range threat to our fleet and to our land bases.

Good teamwork between the Air Force and the Navy pulled the rabbit out of the hat. Is this a dream? Or is this a real possibility?

This study investigates a key element in maritime operations: the command and control required by Air Force and Navy forces in effective joint antiship operations. By comparing the command and control doctrine, procedures, and equipment of the Joint Chiefs of Staff, the Air Force, and the Navy, the author identifies areas of agreement and conflict, highlights problems, and recommends areas for improvements.

Until recently, the Air Force and the Navy went their separate ways, developing doctrine and tactics, conducting operations, and training generations of personnel with different outlooks on military employment. Although the Air Force and the Army have developed an elaborate system of doctrine, procedures, personnel, and equipment for joint operations, the Air Force and the Navy did not need to work so closely together and consequently did not develop coordination procedures beyond the most rudimentary stage.

Today circumstances mandate that the Air Force and the Navy work together. The naval force reductions of the 1970s, the ever-increasing

expense of new systems, the worldwide reductions in overseas bases, and impending budget cuts point toward doing more with less. The increased threat from sophisticated Soviet naval forces and their increasingly ambitious deployments require the capability to field an attack team greater than either the Navy or the Air Force may be able to muster alone.

Until recently the Air Force focused little attention on ship attack. But this operation has gained increased importance in the light of world events. The British losses to antiship missiles in the Falkland Islands during 1984 and the near loss of the USS *Stark* in the Persian Gulf during 1988 highlighted the effectiveness of antiship missiles. The increasing economic and military importance of the Pacific area and the United States' reliance on worldwide trade, carried primarily on ships, emphasizes the importance of military capabilities on the open ocean.

The offensive capabilities of the Air Force and the Navy include a wide selection of aircraft for attacking ships by various means, supporting the attack, and providing command and control. The primary offensive weapon is the Harpoon antiship missile, which can be launched from a variety of strategic and tactical aircraft. Other offensive weapons include high-speed antiradiation missiles launched from Wild Weasel aircraft, mines deployed by strategic and tactical aircraft, and guided munitions launched by tactical aircraft, gravity bombs, and guns. Essential support aircraft provide airborne command and control, reconnaissance, electronic countermeasures, and air-to-air refueling.

Command and control of such diverse forces requires careful coordination from beginning to end. Starting with an essential framework of joint procedures and tactics, commanders must put together a reasonable attack plan and relay it to subordinate elements. Tasked units must understand the plan and assemble the required forces. During execution, aircrews and controllers must function as an integrated attack team to penetrate multi-layer defenses and attack the targets successfully. Throughout the operation, planners and aircrews must find and identify the primary targets amid the clutter of merchant ships and other vessels.

The question is: Can the Air Force and the Navy do this today? They have almost everything needed if they employ their forces together. However, they lack the essential framework of joint procedures, liaison elements, and command and control with which to plan and execute successful joint antiship operations.

This study recommends improvements to the command and control of joint maritime air operations. If the Air Force and the Navy implement these recommendations, they will improve their capability to direct joint operations, increase mutual understanding, and enhance their ability to plan and execute joint antiship operations. The result will be a stronger and more effective force not just in the maritime arena but in any theater where the Air Force and the Navy fight together.

## **Chapter 1**

# **Background**

This chapter provides the background for studying one aspect of joint maritime air operations: command and control. First, this chapter describes milestones in the history of Air Force and Navy maritime air operations. Next, it describes the assigned functions of the Air Force and the Navy in maritime air operations. Finally, it describes the basis of unity of command, the key to effective joint operations. This chapter lays the foundation for deeper study of specific aspects of command and control of maritime air operations mentioned in other chapters.

Although maritime operations are the "bread and butter" of the Navy, both the Navy and the Air Force have extensive experience in this field. The Air Force has considerable capability and interest in this subject, in support of both land and sea operations. Although for many years maritime operations took a backseat to other missions, the Air Force is turning its attention to joint maritime operations with the Navy once again.

## **Air Power in Maritime Operations**

Aircraft have a long history in maritime operations. Both the Air Force (from its initial days as the Air Service in the Signal Corps through intermediate stages as the Army Air Corps and the nearly independent Army Air Forces to its final development as a separate service) and the Navy have used aviation in a variety of missions, which has grown more important with increasingly capable aircraft. Today, aircraft are an integral part of naval operations, with every naval task force depending on aircraft as an essential element of each operation. At the same time, the Air Force is becoming an important partner with the Navy in maritime operations. This section briefly outlines the history of air power in maritime operations.

### **The Early Years**

The Navy undertook the first applications of aircraft to maritime operations. In 1910 a Curtiss aircraft was launched from a cruiser and flew to shore. In 1911 Curtiss demonstrated both a landing on a ship and a subsequent launch. Later that year the Navy bought three aircraft and began experimental flights in antisubmarine and seaplane operations and experiments with radio, aerial photography, and catapult-launching sys-

tems.<sup>1</sup> In 1912 the Navy established its first flight training base at Pensacola, Florida.<sup>2</sup>

The Army also examined the uses of aircraft in maritime operations in addition to the more conventional role of support for ground troops. In 1915 Maj William ("Billy") Mitchell, one of the early American advocates of air power, proposed using aircraft for coastal defense, including reconnaissance, air defense, and antisubmarine warfare.<sup>3</sup>

During World War I, the Navy flew seaplanes in maritime operations. In Great Britain and France, naval aviators flew a variety of missions, including antisubmarine warfare, reconnaissance, and bombing. From Nova Scotia naval aviators flew convoy escort and reconnaissance. Along the Atlantic Coast of the United States, the Navy flew patrol missions from 12 locations. Plans to use land-based Caproni bombers in Italy were unsuccessful due to political and equipment problems.<sup>4</sup>

In 1919 the Department of War and the Navy Department clarified the division of maritime missions between the Army and the Navy. Army aircraft would defend shore establishments and support Navy forces defending the coast. Navy aircraft would support the fleet, primarily those on naval missions: coastal defense, overseas scouting, reconnaissance of coastal areas, and ship attack. Although this statement of missions left some areas overlapping, the role of naval aviation in supporting naval operations was clear. The dependent role of the Air Service supporting Army operations remained primary, but the more independent role of coastal defense remained on the books.<sup>5</sup>

As part of his quest for an independent air force, Billy Mitchell, now a brigadier general, advocated the aircraft as the first line of defense for the United States. This was contrary to the Navy's concept for using naval forces, which centered on the battleship as the primary weapon. In 1921 General Mitchell demonstrated the power of aircraft by using bomber aircraft to sink three battleships. Although this accomplishment did not win for the Air Corps primary responsibility for coastal defense as Mitchell had advocated, the lesson was not lost on the Navy, which began to consider aviation as an important element in maritime operations and started serious experiments in carrier operations.<sup>6</sup> In 1923 the Navy conducted initial flight operations from its first aircraft carrier, the USS *Langley*.<sup>7</sup>

During the 1920s and 1930s, the Navy continued to develop the procedures and equipment required for effective use of aircraft in maritime operations. The Marine Corps developed tactics for dive bombing, which greatly improved accuracy in dropping bombs. In 1930 the Navy began development of its first aircraft designed for dive bombing, the Martin XT5M-1. Later, during World War II, dive-bombing aircraft were the key to defeating the Japanese fleet.<sup>8</sup>

In 1933 the Navy assigned carriers and aircraft directly to the battle force commander, concentrating power and improving control of operations. This reorganization led to the task force concept that contributed to the Navy's wartime success in the Pacific. By 1939 fast carrier task forces

included destroyers and cruisers to provide escorts and antiaircraft defenses. By 1941 the Navy had nine aircraft carriers commissioned and 18 more approved for construction. The Marine Corps developed the concept of smaller escort carriers to transport aircraft for close air support of ground forces. The Navy also adopted escort carriers but used them to train pilots and to ferry aircraft.<sup>9</sup>

In 1939 the Navy demonstrated ship-to-ship refueling at sea, the key to sustained operations by aircraft carriers and other ships. The Navy continued these experiments to refine the process and to develop procedures for routine resupply at sea.<sup>10</sup>

### **World War II: The Golden Years**

World War II highlighted the importance of aircraft in maritime operations. Especially in the Pacific, carrier-based naval aviation was the decisive factor in early Japanese victories and subsequent Allied supremacy. Naval forces fought beyond the range of battleship guns with only carrier-based aircraft as the attacking force. Land-based patrol aircraft flew reconnaissance along the coasts and into the open ocean in support of convoys.<sup>11</sup> Bombers defended the coasts of the United States by identifying surface vessels and attacking hostile ships, especially submarines. Aircraft carriers became the basic unit of every task force. Tactics developed to include air power in every aspect of naval operations.<sup>12</sup>

Japanese carrier-based aircraft set the example for the Pacific war. Their 7 December 1941 attack on Pearl Harbor demonstrated the power of naval aviation against ports, ships at anchor, and shore-based support facilities. Two days later, off Malaya, the Japanese navy demonstrated for the first time the wartime capabilities of naval aviation against major combatant ships by sinking two fully operational heavy ships of the British navy, a battleship (*Prince of Wales*) and a heavy cruiser (*Repulse*).<sup>13</sup>

The first battles between aircraft carrier naval task forces changed the course of the Pacific war and firmly established the importance of carrier-based aircraft in maritime operations. At the Battle of the Coral Sea in May 1942, two American carriers fought two Japanese carriers, preventing the blockade of sea-lanes to Australia and eliminating Japan's most experienced naval aviators. A month later at Midway, an American carrier task force decisively defeated a Japanese force, ending the expansion of Japanese forces in the Pacific. The Battle of Midway was fought only by aircraft and ended the dominance of the battleship in naval warfare.<sup>14</sup>

The importance of land-based aircraft in maritime operations was demonstrated in two actions in the South Pacific. In 1942 aircraft based at Henderson Field on Guadalcanal stopped Japanese eastward expansion across the Solomon Islands by maintaining air superiority and by preventing reinforcement of Japanese forces on the islands. In 1943 Army Air Forces aircraft operating from New Guinea destroyed a Japanese convoy attempting to reinforce forces in northern New Guinea. Here, the Battle of

the Bismarck Sea ended Japanese hopes of holding positions in New Guinea and opened the way for further Allied advances toward the Philippines.<sup>15</sup>

In summary, World War II brought the role of both Navy and Air Force aircraft in maritime operations to maturity. Carrier-based aircraft replaced the firepower of naval artillery and ended the supremacy of the battleship in naval warfare. Land-based aircraft showed their capabilities in many areas of maritime operations, such as surveillance, antisubmarine warfare, antisurface warfare, and other support for naval operations. Future naval operations and planning would depend on the lessons learned in World War II, especially the importance of air power as a critical element of maritime operations.

### **Decline and Renewal**

In the rapid demobilization following World War II, the Navy and the Air Force lost most of their combat readiness, including their capabilities for using aircraft in maritime operations. While the Navy recognized the importance of naval aviation, the exodus of experienced personnel and decommissioned combat aircraft destroyed all but the barest claim to preparedness. The effect on the Air Force was even greater. By December 1947 the Air Force had only two groups capable of combat operations.<sup>16</sup>

While the Navy went on to develop the maritime employment of its aircraft, the Air Force neglected maritime operations for other missions, which were more important to national security and more directly related to the Air Force's primary responsibilities. During the 1950s the Air Force devoted its resources to strategic missions as assigned to the Strategic Air Command.<sup>17</sup>

In the early 1980s the Air Force finally turned back to its earlier interest in maritime operations. In 1982 the Air Force and the Navy signed agreements to enhance Air Force participation in maritime operations and to enhance joint operations. These agreements stated the intention to increase interservice training and exercises, to develop joint doctrine, and to provide mutual support in maritime operations.<sup>18</sup>

Since the signing of these agreements, the Air Force has reversed the decline of its maritime capabilities. Six B-52 squadrons have maritime capabilities, including two squadrons equipped with the Harpoon antiship missile, and all six squadrons are trained in mine warfare and sea surveillance. On the tactical side, the Pacific Air Forces is equipping a squadron of F-16 aircraft with the Harpoon, while other fighters provide air defense for Navy battle groups. In the support role, KC-135 and KC-10 aircraft provide air-to-air refueling for Air Force and Navy aircraft in maritime operations.<sup>19</sup>

Chapter 5 describes current programs to enhance joint Air Force and Navy maritime operations.



## Maritime Functions of the Air Force and the Navy

Following passage of the National Security Act of 1947, two important conferences, one at Key West, Florida, in 1947 and the other at Newport, Rhode Island, in 1948, defined the roles and missions of the Air Force and the Navy, including those in maritime operations. The Navy was worried about three key issues. The first one was the Navy's future role in strategic air missions. The second one was whether the Navy would retain its air forces or lose them to the Air Force. The third issue was whether the Navy would lose the Marine Corps to the Army. These conferees decided that the Air Force was responsible for strategic air operations. The Navy retained its air forces and the Marine Corps for fleet use.<sup>20</sup>

The Joint Chiefs of Staff and the Department of Defense incorporated the agreements reached at the Key West and Newport conferences into military doctrine. Department of Defense Directive (DODD) 5100.1, *Functions of the Department of Defense and Its Major Components*, and Joint Chiefs of Staff Publication 0-2, *Unified Action Armed Forces (UNAAF)*, list essentially the same missions for the components as were agreed to at these key conferences.<sup>21</sup>

The following paragraphs detail the functions of the Air Force and the Navy with respect to maritime operations. The services are equally responsible for both primary and collateral functions but may not use collateral functions as justification for additional forces.<sup>22</sup>

### The Air Force

DODD 5100.1 assigns the following primary functions, among others, to the Air Force:

To organize, train, equip, and provide forces for the conduct of prompt and sustained combat operations in the air—specifically, forces to defend the United States against air attack in accordance with doctrines established by the Joint Chiefs of Staff, gain and maintain general air supremacy, defeat enemy air forces, conduct space operations, control vital air areas, and establish local air superiority.

To organize, train, equip, and provide land-based tanker forces for the in-flight refueling support of strategic operations and deployments of aircraft of the Armed Forces and Air Force tactical operations.

To provide equipment, forces, procedures, and doctrine necessary for the effective prosecution of electronic warfare operations and, as directed, support of other forces.<sup>23</sup>

In addition, the Air Force is assigned the following collateral functions:

- a. Surface sea surveillance and antisurface ship warfare through air operations.
- b. Antisubmarine warfare and antiair warfare operations to protect sea lines of communications.
- c. Aerial minelaying operations.
- d. Air-to-air refueling in support of naval campaigns.<sup>24</sup>

These functions clearly define Air Force responsibilities in the maritime environment. The primary roles are not limited to operations over land but

concern operations in the air, whether over land or over water. The collateral functions clearly concern operations over the sea and most logically concern operations coordinated with the Navy, although the first three operations do not specifically mention Navy participation.

Although the primary and collateral functions of the Air Force can involve any service component, this study concentrates on joint operations involving the Air Force and Navy and on the interface between the Air Force and Navy, because these components are the most likely to be involved in joint antiship operations.

Chapter 3 describes the Air Force's concept of warfare and its command and control structure for conducting operations.

### **The Navy**

DODD 5100.1 assigns the following primary function, among others, to the Navy:

To organize, train, equip, and provide Navy . . . forces for the conduct of prompt and sustained combat incident to operations at sea, including operations of sea based air components—specifically, forces to seek out and destroy enemy naval forces and to suppress enemy sea commerce, to gain and maintain general naval supremacy, to control vital sea areas and to protect vital sea lines of communications, to establish and maintain local superiority (including air) in an area of naval operations, to seize and defend advanced naval bases, and to conduct such land, air, and space operations as may be essential to the prosecution of a naval campaign.<sup>25</sup>

Chapter 4 describes how the Navy performs this function and details its organization, its chain of command, and its composite warfare commander concept, the Navy's methodology for controlling offensive and defensive battle group operations.

## **Unified Command**

The National Security Act of 1947 reorganized the military forces of the United States and provided unified direction for all the services. This act gave the Air Force independence from the Army and at the same time established a secretary of defense to coordinate the administration of the Army, Navy, and Air Force. The act also established the office of the Joint Chiefs of Staff to advise the president and secretary of defense on military matters. In the 1949 amendments to the National Security Act, the secretary of defense became superior to the service secretaries, who lost their cabinet positions. These amendments further unified the operations of the separate services while maintaining their separate identities and traditions.<sup>26</sup>

The principle of unity of command was further strengthened by the Department of Defense Reorganization Act of 1958. This legislation put the

secretary of defense in the military chain of command and created the unified and specified combatant commands. These commands were fully responsible for directing military operations. The military services, on the other hand, lost this operational command and were made subordinate to the commanders of the combatant commands in military operations.<sup>27</sup>

The Goldwater-Nichols Department of Defense Reorganization Act of 1986 strengthened the Joint Chiefs of Staff. The chairman became the primary voice of the Joint Chiefs of Staff with the other members subordinate to this position. Additionally, the Joint Chiefs of Staff became solely responsible for developing joint doctrine.<sup>28</sup>

Since World War II the military command structure has moved toward unified command of operations. The role of the individual services has become one of supplying forces, organization, and equipment. The unified and specified combatant commands are now the employer of these forces to accomplish the missions assigned by the president and secretary of defense. Initially, the role of the Joint Chiefs of Staff was included in the military organization and then strengthened under the leadership of the chairman, as the spokesman for the entire forum.

Chapter 2 describes the development of joint doctrine by the Joint Chiefs of Staff with emphasis on joint maritime air operations and command and control of joint forces.

## **Summary**

From the earliest days of powered flight, aircraft have had roles in maritime operations. During the period before World War II, the services experimented with various uses for aircraft and developed specific tactics for maritime operations. During World War II maritime air operations made significant strides in combat and reached its most extensive employment. Following the war the Navy continued development of maritime air operations, but the Air Force concentrated on other applications of air power. Today, both the Air Force and the Navy are engaged in developing procedures for employing their forces together.

The key to effective joint operations is command and control. Since 1947 the principle of unity of command has become even stronger. But before unity of command can work, the services must have a mutually agreed-upon doctrine, compatible equipment, and common tactics. Chapters 2, 3, and 4 describe the command and control doctrine and the organizational doctrine first as prescribed by the Joint Chiefs of Staff for joint operations and then by the Air Force and the Navy as they interpret the joint doctrine and adapt it for their separate and joint operations. Chapter 5 describes programs to improve joint maritime operations. Chapter 6 draws conclusions about the way the Air Force and the Navy work together and recommends changes to improve joint antiship operations.

### Notes

1. William Armstrong, "Aircraft Go to Sea: A Brief History of Aviation in the U.S. Navy," *Aerospace Historian*, June 1978, 79-91.
2. Robert Sherrod, *History of Marine Corps Aviation in World War II* (Washington, D.C.: Combat Forces Press, 1952), 1-18.
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5. Joe C. Dixon, *History of U.S. Airpower* (Gunter AFS, Ala.: Extension Course Institute, 1984), 1:49.
6. Hurley, 58-70.
7. Dixon, 1:59-62.
8. *Ibid.*, 2:19.
9. *Ibid.*, 2:48-9.
10. *Ibid.*, 2:54.
11. *Ibid.*, 2:14.
12. *Ibid.*, 3:6.
13. *Ibid.*
14. *Ibid.*
15. *Ibid.*
16. *Ibid.*
17. *Ibid.*
18. Memorandum of Agreement between the chief of Naval Operations and the chief of staff, United States Air Force, subject: Joint USN/USAF Efforts to Enhance USAF Contribution to Maritime Operations, 9 September 1982; Memorandum of Agreement between the Department of the Navy and the Department of the Air Force, subject: Joint USN/USAF Efforts for Enhancement of Joint Cooperation, 25 October 1982.
19. Maj Duane Bender, Tactical Air Command, deputy chief of staff for plans, Joint Doctrine Division, staff summary sheet, Maritime Operations, 23 September 1988, 5-7.
20. Dixon, 2:73-5.
21. Department of Defense Directive 5100.1, *Functions of the Department of Defense and Its Major Components*, 25 September 1987, 13.
22. *Ibid.*
23. *Ibid.*, 19-20.
24. *Ibid.*, 20.
25. *Ibid.*, 16.
26. Dixon, 2:73-75.
27. Robert Frank Futrell, *Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force, 1907-1964* (Maxwell AFB, Ala.: Air University, 1971), 288.
28. Joint Chiefs of Staff Publication 1-01, *Joint Publication System (Joint Doctrine and Joint Tactics, Techniques, and Procedures Development Program)*, 15 April 1988, 1-2.

## **Chapter 2**

# **Joint Command and Control Doctrine**

This chapter describes joint command and control doctrine with special emphasis on maritime operations. It covers the responsibility for joint doctrine, the command arrangements as affected by recent legislation, the status of joint doctrine, the need for interoperability, the joint publication system, the joint forces air component commander concept, the joint maritime air operations doctrine, and the joint tasking doctrine.

Joint doctrine applies to the operational command of forces by unified and specified commanders and to situations where significant forces of one service component support forces of another service.<sup>1</sup> A joint task force is one such situation. The joint task force commander is tasked to perform a mission and is assigned forces to complete the mission. The assigned forces originate from different service components but must be able to work together as a coordinated team. The "glue" that binds the forces together and also allows them to understand the commander and each other is joint doctrine.

### **Responsibility for Joint Doctrine**

Department of Defense Directive 5100.1 directs the chairman of the Joint Chiefs of Staff to "develop and establish doctrine for all aspects of the joint employment of the Armed Forces."<sup>2</sup> The Air Force and the Navy are directed to develop doctrine in coordination with other service components for types of military operations for which they are primarily responsible.

For example, the Air Force develops doctrine for air defense from land areas—a military function which the Air Force dominates—and electronic warfare operations. In addition, the Air Force develops doctrine for Air Force forces in amphibious operations and airborne operations, areas in which the Navy and the Army have primary responsibility.<sup>3</sup>

On the other hand, the Navy has primary responsibility for developing doctrine for naval forces and joint forces in amphibious operations. (The Marine Corps develops doctrine for the landing force in amphibious operations.) In addition, the Navy develops doctrine for Navy forces in space operations and for electronic warfare.<sup>4</sup>

In some cases, the two services have responsibility for developing doctrine in a particular area. For maritime air operations, the Navy has primary responsibility for developing joint doctrine. However, the Air Force is required to assist the Navy in developing joint maritime air operations. The latest development in joint maritime air operations is Joint Chiefs of Staff Test Publication 3-04, *Doctrine for Joint Maritime Operations (Air)*. More about this document appears later in this chapter.

## **Command and Organization**

JCS Publication 0-2, *Unified Action Armed Forces (UNAAF)*, "sets forth principles and doctrines to govern the joint activities and performance of the armed forces."<sup>5</sup> It describes principles governing the unified direction of forces, the operational chain of command for joint operations, the unified and specified commands, and the joint staffs.<sup>6</sup>

### **Principles Governing the Unified Direction of Forces**

Commands are organized for the main purposes of accomplishing the assigned mission and attaining an objective.

Sound command organization should provide for unity of effort, centralized direction, decentralized execution, common doctrine, and interoperability. Unity of effort is necessary for effectiveness and efficiency. Centralized direction is essential for controlling and coordinating the efforts of the forces. Decentralized execution is essential because no one commander can control the detailed action of a large number of units or individuals. Common doctrines are essential for a mutual understanding and confidence between a commander and assigned subordinates, and among the subordinates themselves, so that timely and effective action will be taken by all concerned in the absence of specific instructions. Command emphasis on interoperability will result in enhanced joint warfighting capabilities through improved joint tactics, techniques, and procedures.<sup>7</sup>

### **Operational Chain of Command for Joint Operations**

The operational chain of command begins with the president and runs through the secretary of defense to the commanders in chief (CINCs) of the unified and specified commands, which are established to perform specific missions. The chairman, Joint Chiefs of Staff, provides advice and assistance to the president, transmits orders to the CINCs for the president and secretary of defense, and relays and presents reports from the CINCs to the president and the secretary of defense. The CINCs have operational command over their assigned forces and are fully responsible for their preparedness and performance.<sup>8</sup>

The CINCs have "full authority to organize forces" as they see fit to accomplish assigned missions. They can also delegate operational control or tactical control to subordinate commanders.<sup>9</sup>

The CINCs can exercise their operational command through subordinate commands. Some common command arrangements are subordinate unified commands (when authorized by the chairman of the Joint Chiefs of Staff), service component commands, joint task forces (for specific limited objectives), and functional component commands (such as the joint forces air component commander that will be discussed later).<sup>10</sup>

To effectively control assigned forces, the CINCs can assign degrees of control to subordinate commanders. Operational control includes most of the powers of operational command but is limited in authority over logistics and may be restricted in its ability to organize forces. Tactical control is limited to directing "movements and maneuvers" to accomplish assigned missions.<sup>11</sup>

The operational chain of command should not be confused with the administrative chain of command, which runs from the president to the secretary of defense to the secretaries of the service departments to the commanders of the services. The administrative command prepares, administers, and supports forces. The command is subordinate to operational command, providing support to the war-fighting commanders.<sup>12</sup>

### **Status of Joint Doctrine**

Although joint doctrine represents the coordinated guidance of the service components and the Joint Chiefs of Staff, the CINCs organize and command their forces as they deem necessary. Joint doctrine is provided for guidance, but the CINCs must consider the situation of the command before accepting or modifying joint doctrine.<sup>13</sup>

### **Interoperability**

JCS Publication 0-2 states that "unified action demands maximum interoperability."<sup>14</sup> For the forces of different services to effectively operate together, they must have a common frame of reference and compatible equipment. They also must have common doctrine, tactics, techniques, and procedures. They must work together to develop common plans and to test those plans together in training exercises. They must have equipment that allows them to communicate freely and to provide mutual logistical support.<sup>15</sup>

The chairman, Joint Chiefs of Staff, is responsible for the joint interoperability program. The CINCs have the responsibility to "ensure maximum interoperability" and to "identify interoperability issues to the Chairman."<sup>16</sup>

## **Joint Publication System**

Joint doctrine is published under the joint publication system. JCS Publication 1-01, *Joint Publication System (Joint Doctrine and Joint Tactics*,

*Techniques, and Procedures Development Program*), describes the development of joint doctrine. Service chiefs, commanders of unified and specified commands, and joint staff directors can develop joint doctrine. During this development of joint doctrine, existing service doctrine is used as a guide to provide consistency and continuity. However, after approval, joint doctrine must be the basis for subsequent development of service doctrine and, as the national position on doctrine, also must be the basis for developing combined doctrine with our allies.<sup>17</sup>

Much of the literature concerning operations of more than one service working together is not *joint doctrine* in the strictest sense of the word. JCS Pub 1-01 directs that

only publications approved by the Joint Chiefs of Staff will be referred to as "joint publications" without further clarification. Publications that have not been reviewed and approved by the Joint Chiefs of Staff, regardless of whether they involve two or more Services, shall be referred to as "multi-service" and shall identify the participating services.<sup>18</sup>

How this restriction affects terminology beyond the titles of publications has not been determined. However, many Air Land Force Application (ALFA) Agency publications use *joint* (e.g., joint suppression of enemy air defenses and joint attack of the second echelon). ALFA is moving away from this terminology in its latest publications, but the old names remain in previously published works and will continue in common usage until replaced by newer, more precise terms.<sup>19</sup>

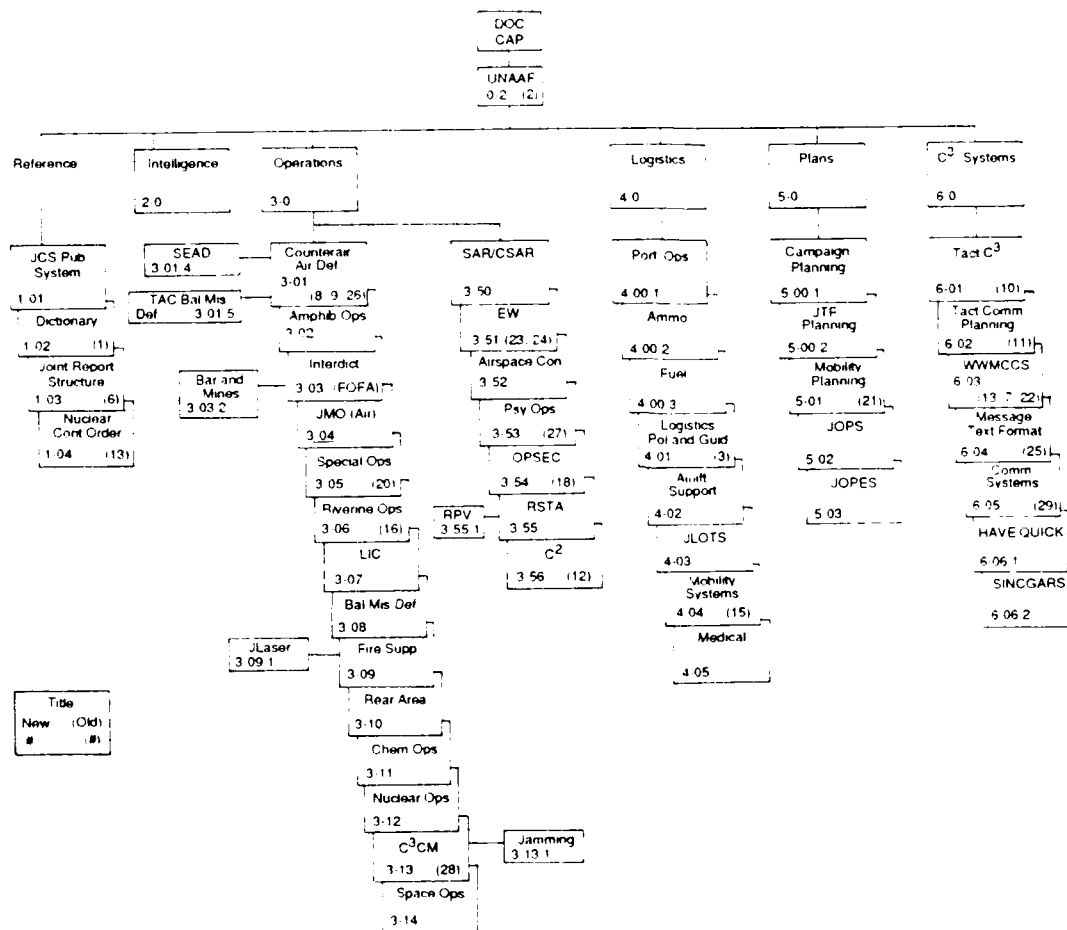
Effective 1 May 1988 the Joint Chiefs of Staff renumbered all JCS publications to provide a logical and consistent organization for these documents.<sup>20</sup> The new numbering system contains a hierarchy of series following standard joint staff lines. A keystone manual forms the foundation for each series. For example, the operations series contains JCS Pub 3-0, *Doctrine for Joint Operations*, the keystone manual for operations; JCS Pub 3-01.2, *Joint Doctrine for Theater Counterair Operations*; and JCS Pub 3-01.4, *JTTP for Suppression of Enemy Air Defense*, among others. Figure 1, taken from JCS Pub 1-01, shows the JCS publication system and clearly illustrates the organization along the traditional military functions of intelligence, operations, logistics, and plans.

The new JCS publications organization highlighted areas where fundamental guidance was lacking. For instance, none of the "keystone manuals" existed when the publications were reorganized. As indicated in figure 1, the keystone manuals for intelligence, operations, logistics, plans, and command, control, and communications systems were under development when the new numbers became effective in 1988.<sup>21</sup>

## **Joint Maritime Air Operations**

Joint doctrine for maritime air operations is currently under development. JCS Test Publication 3-04, *Doctrine for Joint Maritime Operations*





Source: JCS Pub 1-01, *Joint Publication System (Joint Doctrine and Joint Tactics, Techniques, and Procedures Development Program)*,  
15 April 1988.

Figure 1. JCS Publication System.

(Air), contains proposed joint doctrine for use during joint maritime operations (JMO). This document has been staffed through joint planning channels and released for evaluation by the services in the field. Although it has not been officially approved, JCS Test Pub 3-04 represents the latest guidance for maritime air operations involving two or more services.<sup>22</sup>

The term *JMO (Air)* means joint maritime air operations and applies to the maritime environment. JCS Test Pub 3-04 defines the maritime environment as "oceans, seas, bays, estuaries, islands, and coastal areas and the airspace above them, including amphibious operations areas."<sup>23</sup> Since all services have not yet agreed to this definition, it will not enter JCS Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms*, until the components approve JCS Test Pub 3-04.<sup>24</sup> However, this study will use this meaning of maritime operations.

JMO (Air) includes operations in two basic categories: sea control and power projection. JMO (Air) seeks to destroy or reduce the enemy threat to friendly forces, suppress enemy commerce, gain air superiority, protect sea lines of communications and sea areas, and support land operations. Sea control comprises actions to destroy or neutralize enemy aircraft, ships, and submarines that threaten friendly forces, including operations to locate and destroy hostile forces, barrier operations to block enemy access to maritime areas, screen operations around friendly forces, and mining operations to include countermeasures against enemy mines.

Power projection comprises the offensive operations needed to attack enemy forces and logistics support. These operations include amphibious assaults, attacks on targets ashore, and support of sea control operations.<sup>25</sup>

### **Joint Forces Air Component Commander**

For joint maritime air operations, the joint forces commander will "normally designate a joint force air component commander (JFACC) who will coordinate air operations for the joint force."<sup>26</sup> Usually the JFACC is "the service component commander who has the preponderance of air assets to be used and the ability to assume responsibility for their use."<sup>27</sup>

The JFACC is responsible for planning, coordinating, allocating, and tasking the air resources based on the apportionment approved by the joint forces commander. The JFACC recommends apportionment in coordination with other component commanders.<sup>28</sup>

### **Responsibilities for Joint Maritime Air Operations**

The Navy is responsible for developing doctrine, techniques, and procedures for joint maritime air operations and for evaluating and coordinating them with the other services and the CINCs. The Navy is also responsible for developing systems and equipment for these operations and for ensuring interoperability.

The Air Force is responsible for assisting the Navy in its responsibilities to enhance capabilities in maritime operations.<sup>29</sup>

## Operations

Since the maritime environment includes both land and sea areas, maritime operations require close coordination between sea- and land-based forces when they participate in the same operations. To coordinate maritime operations, the joint force commander apportions forces among the missions and tasks.

The primary missions and tasks include: antisurface warfare, antisubmarine warfare, antiair warfare/defensive counterair, mine warfare, offensive counterair (also conducted by the Navy as strike warfare), air interdiction (conducted by the Navy as strike warfare), close air support, reconnaissance, and ocean surveillance. The publications generally use Navy classifications for sea missions and Air Force-Army classifications for land missions.<sup>30</sup>

The support warfare missions and tasks include: command, control, communications, and intelligence (C<sup>3</sup>I), electronic warfare, suppression of enemy air defenses, special operations, aerial refueling, and combat search and rescue.<sup>31</sup>

Joint maritime air operations can also support amphibious maneuvers. This extremely complex system encompasses all other maritime missions and requires close coordination of all participating forces.

Space systems can also support joint maritime air operations in a variety of ways. By providing communications, surveillance, weather and oceanographic data, and navigational positioning, space systems enhance planning and execution at all levels of command.<sup>32</sup>

## Air Tasking Cycle

A key element of joint maritime air operations is the air tasking cycle by which the joint force commander, the joint force air component commander, component commanders, and subordinate commands coordinate air operations. The messages of the air tasking cycle relay requests for support, apportionment and allocation, and air tasking orders between all echelons of command.

JCS Publication 3-56.24, *Tactical Command and Control Planning Guidance and Procedures for Joint Operations, Joint Interface Operational Procedures—Message Text Formats*, describes the joint air tasking cycle and outlines the formats of messages used in the process. A standardized format, called message text format, is used for the series of messages required for the various aspects of forecasting requirements and capabilities, apportioning, tasking, and confirming mission assignments and completion.<sup>33</sup>

Since each joint force usually has more than one component with air assets, the joint force commander must coordinate the different operations of the component air elements. The joint force commander accomplishes

this function by "apportionment guidance and the cross-force allotment of component excess sorties."<sup>34</sup> If appointed, the JFACC coordinates air operations with the component commanders and allocates sorties as directed by the joint force commander.<sup>35</sup>

The air tasking cycle begins with the joint force commander's apportionment process, in which the tactical air effort is divided among geographic areas of operations by percentage or priority. The JFACC recommends the apportionment, in coordination with the service component commanders, based on the commander's guidance. The joint force commander approves or changes the apportionment recommendation after consultation with component commanders.<sup>36</sup>

The air tasking cycle is based on air tasking days as defined by the joint force commander in operations plans. A 24-hour day is typically used for air tasking. Although the timing varies with the command, the following planning points are typical. The joint force commander provides apportionment guidance 30 hours before the air tasking day begins. Subordinate and supported commands provide forecasts of available missions and requests for air support 24 hours before the air tasking day begins; the JFACC "allots" missions to components 19 hours before the air tasking day begins. Finally, the components must provide specific tasking (target, time, and coordination information) 12 hours before the air tasking day begins. Although this process is lengthy, quicker reaction is possible by the use of alert aircraft or the "immediate" tasking process.<sup>37</sup>

## **Summary**

This chapter describes the basis of joint doctrine, the joint doctrine for joint maritime air operations, and the command and control of joint operations.

Joint doctrine provides the framework for joint military operations, but the framework has adequate flexibility for commanders to meet widely diverse challenges in the composition and capabilities of assigned forces, in the assigned mission, in geographical areas of operations, and in enemy threat. In meeting these challenges, the commander must tailor the joint force command structure, command and control arrangements, and assignment of missions to subordinate commands. In other words, the commander must begin with the basic guidance of joint doctrine and adapt it to the particular circumstances of the joint force.

On the other hand, service components must develop service doctrine from the framework provided by joint doctrine. While developing service doctrine, the components must evaluate their individual missions and capabilities to adapt joint doctrine to the needs of each service.

The next two chapters look at how the Air Force and the Navy interpret joint doctrine and implement it in their own operations. Later chapters compare the doctrine of the Air Force and the Navy, point out areas of

agreement and conflict, and make recommendations for the improvement of joint maritime operations.

#### Notes

1. Joint Chiefs of Staff Publication 0-2, *Unified Action Armed Forces (UNAAF)*, 1 December 1986, 3.
2. Department of Defense Directive 5100.1, *Functions of the Department of Defense and Its Major Components*, 25 September 1987, 5.
3. *Ibid.*, 19-20.
4. *Ibid.*, 15-16.
5. JCS Pub 0-2, 1.
6. *Ibid.*, 3-2.
7. *Ibid.*
8. *Ibid.*, 1-2.
9. *Ibid.*, 3-9.
10. *Ibid.*, 3-24 through 3-28.
11. *Ibid.*, 3-9.
12. *Ibid.*, 1-2.
13. JCS Pub 1-01, *Joint Publication System (Joint Doctrine and Joint Tactics, Techniques, and Procedures Development Program)*, 15 April 1988, 1-3.
14. JCS Pub 0-2, 1-3.
15. *Ibid.*
16. *Ibid.*
17. JCS Pub 1-01, 1-4.
18. *Ibid.*, 1-3.
19. For example, a recent ALFA project is designated CSAR (combat search and rescue) in the coordinating draft "Multi-Service Procedures for Combat Search and Rescue." What will happen to the older terms is unclear.
20. JCS Pub 1-01, 1-4.
21. *Ibid.*, IV-1.
22. JCS Test Pub 3-04, *Doctrine for Joint Maritime Operations (Air)*, 1 May 1988, i.
23. *Ibid.*, viii.
24. *Ibid.*
25. *Ibid.*, 1-2 through 1-4.
26. *Ibid.*, III-5.
27. *Ibid.*, III-6.
28. *Ibid.*, III-6 through III-7.
29. *Ibid.*
30. *Ibid.*, IV-1 through IV-2.
31. *Ibid.*
32. *Ibid.*, IV-15 through IV-16.
33. *Ibid.*, V-1.
34. JCS Pub 3-56.24, *Tactical Command and Control Planning Guidance and Procedures for Joint Operations, Joint Interface Operational Procedures—Message Text Formats*, 1 August 1986, III-45.
35. *Ibid.*
36. *Ibid.*, III-48.
37. *Ibid.*, III-49 through III-51.

## Chapter 3

# Air Force Command and Control

As described in chapter 2, joint doctrine for command and control combines forces of the service components under the unified combatant commands or subordinate joint forces. Each component commander directs assigned forces to accomplish the mission based on the guidance of the joint commander while coordinating with the other components to prevent conflicting actions and to gain mutual support.

This chapter describes how the Air Force controls its forces through the tactical air control system based on the principles of centralized planning and control and decentralized execution. The daily air operations are outlined in the air tasking order, which contains details of all Air Force missions and any necessary coordination instructions.

## Air Force Doctrine

The Air Force provides an extensive system of aerospace doctrine to guide commanders during military action and to help all airmen understand the purpose of the Air Force. This doctrine is based on military experience and analysis of previous actions. Although aerospace doctrine represents what has worked best in the past, the commander must use judgment when applying doctrine to a particular situation.

### Types of Aerospace Doctrine

The Air Force doctrine provides three levels: basic, operational, and tactical. Each level of doctrine is described in a separate series of Air Force manuals.

Basic doctrine covers the fundamental and enduring principles which guide the use of air power. Air Force Manual (AFM) 1-1, *Basic Aerospace Doctrine of the United States Air Force*, and other manuals of this series cover basic doctrine. Operational doctrine provides more specific guidance based on the principles of basic doctrine. The Air Force describes operational doctrine in its 2-series manuals. Operational doctrine includes

the proper use of aerospace forces in the context of distinct objectives, force capabilities, broad mission areas, and operational environments. Operational

doctrine describes the organization of aerospace forces, and it anticipates changes and influences which may affect military operations, such as technological advances.<sup>1</sup>

Tactical doctrine applies basic and operational doctrine to specific weapon systems, specific situations, and specific operations. The Air Force publishes tactical doctrine in its 3-series manuals.<sup>2</sup>

### **Unified Action**

Military forces are defined by the medium in which they operate as land, naval, or aerospace forces. Each force has certain characteristics derived from its operating medium. However, each force can affect the operation of the other forces by coordinating and supporting their actions.

The medium for aerospace forces is the aerospace environment, or everything above the surface of the earth. The aerospace environment includes the atmosphere and beyond into space. The continuity of the aerospace environment over all areas of the earth allows aerospace forces freedom of movement, unhampered by the geographic restrictions of land and naval forces, and allows aerospace forces to operate worldwide.<sup>3</sup>

AFM 1-1 states that

the basic objective of aerospace forces is to win the aerospace battle—to gain and/or maintain control of the aerospace environment and to take decisive actions immediately and directly against an enemy's warfighting capacity. These actions include neutralizing or destroying the enemy's forces, his command and control mechanisms, and his sustaining warfighting capacity.<sup>4</sup>

In addition to the primary objective of winning the air battle, aerospace forces support land and naval forces by countering enemy aerospace forces and controlling the aerospace environment. Integration of the land, naval, and aerospace forces is essential to successful military operations.<sup>5</sup>

### **Air Force Missions and Specialized Tasks**

As described in chapter 1, the Air Force has primary and collateral functions. These functions relate to missions and specialized tasks. Missions are broad objectives for the employment of air forces, while specialized tasks enhance the accomplishment of these missions.

The following Air Force missions are related to antiship operations. The counterair mission gains control of the aerospace environment and includes offensive counterair (attacking airfields and support facilities in enemy territory), defensive counterair (attacking forces which are attacking friendly forces), and suppression of enemy air defenses (attacking enemy air defense systems). The air interdiction mission prevents the enemy from attacking friendly forces by disrupting assembly areas, transportation, supplies, and communications. The close-air-support mission backs surface forces by attacking nearby enemy forces. The aerospace surveillance and reconnaissance mission collects planning information from broad geographic areas or from smaller, precise targets to support planning and ongoing operations. Finally, the aerospace maritime operations mission

neutralizes enemy naval forces or supports friendly naval forces and shipping.

Among the Air Force specialized tasks, several uphold antiship operations. Aerial refueling extends the range of aircraft, an especially important task considering the long distances involved in most ocean operations. Electronic combat controls the electromagnetic spectrum in support of combat operations. Intelligence predicts enemy actions, reduces surprise, and provides target information. Finally, warning and command, control, and communications detect impending attack and tie together military operations.

### **Aerospace Maritime Operations**

The aerospace maritime operations mission is unique among the missions of the Air Force because it includes other missions. For example, maritime operations can include counterair operations, reconnaissance and surveillance, interdiction, and close air support. Maritime operations can also include the specialized tasks of aerial refueling, electronic combat, intelligence, warning, and command, control, and communications.<sup>6</sup>

While the Air Force combines several missions and specialized tasks to derive the mission of aerospace maritime operations, the Navy uses completely different classifications to describe very similar operations. Navy classifications are described elsewhere as part of the composite warfare commander concept of operations.

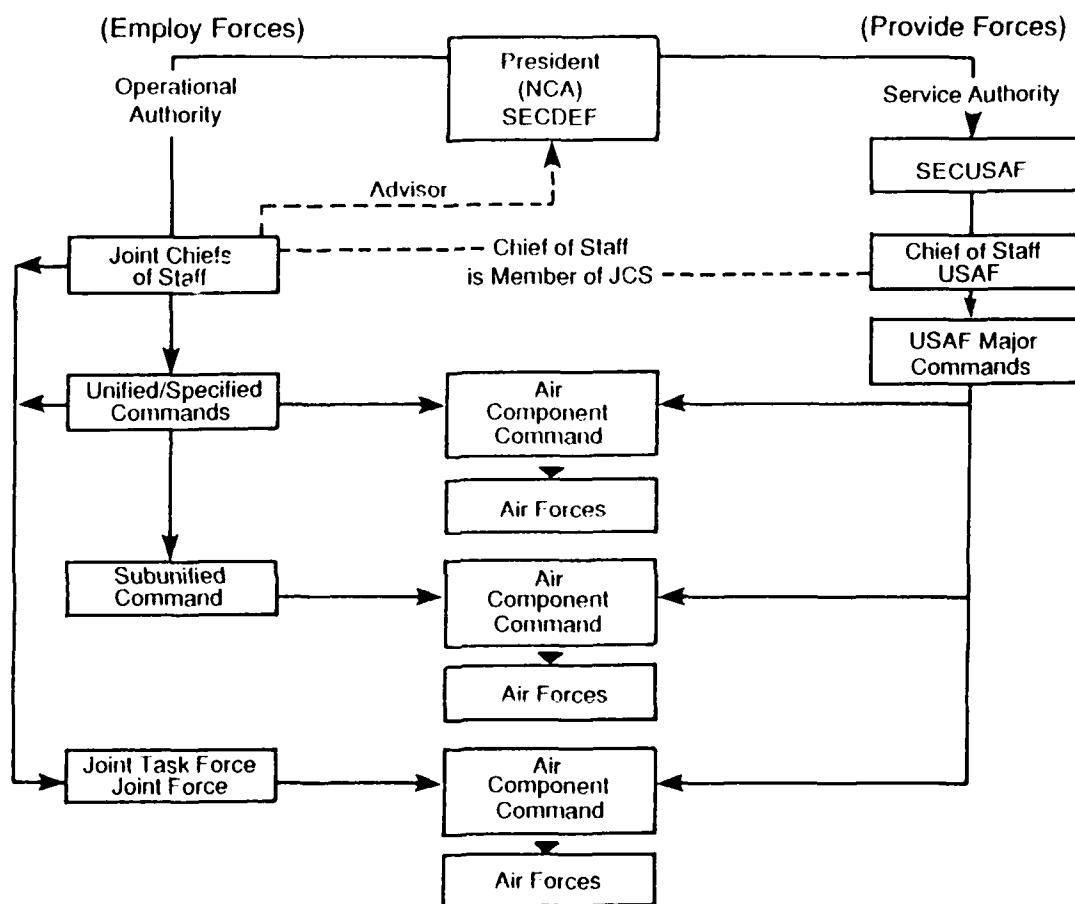
## **Air Force Organization**

The Air Force is organized along two separate chains of command, administrative and operational. The administrative chain of command runs through the secretary of the Air Force and serves to prepare forces for combat operations. The operational chain of command runs through the unified and specified commands, which actually direct combat operations as described in chapter 2.<sup>7</sup> Figure 2 depicts the two branches of Air Force organization.

### **Chain of Command**

The Air Force chain of command is a reflection of Air Force doctrine. Two important qualities of air power are its flexibility and its ability to concentrate force. Since these qualities are weakened if air forces are divided between commanders, a single air component commander must control all air forces. When all air forces are under a single commander, the military mission benefits most from these qualities of air power.<sup>8</sup> The use of service component commanders (e.g., Air Force component commander) instead of functional component commanders (e.g., air component commander) is a





Source: Air Force Manual 1-1, *Basic Aerospace Doctrine of the United States Air Force*, 16 March 1984.

Figure 2. Air Force Dual-Command Structure.

matter of continuing discussion between the military components, especially between the Air Force and the Navy. The Air Force tacitly accepts the service component commander concept by using the term *Air Force component commander* in most command and control documents. The JFACC concept introduced in chapter 2 is a compromise between the two points of view.

In a joint force, such as a unified command, subordinate unified command, or a joint task force, the Air Force component commander directs the operations of the tactical air forces assigned to the joint force. In addition, the Air Force component commander may control air defense and may provide airspace control for the joint force area depending on the relative size of forces available from the other military components and their capabilities.<sup>9</sup>

In Tactical Air Command Regulation (TACR) 55-45, *Tactical Air Force Headquarters and the Tactical Air Control Center*, the latest Air Force guidance on the subject, the JFACC is assumed to be the Air Force component commander. If the JFACC is from another service, the Air Force component commander conducts operations in accordance with the JFACC's guidance and tasking.<sup>10</sup>

At the direction of the Joint Chiefs of Staff, Strategic Air Command (SAC), a specified command, will provide forces to a unified command for aerial refueling, reconnaissance, and air-to-surface operations. In this case, SAC will send an advanced echelon to assist the Air Force component commander in planning and employing the strategic forces. The strategic forces will remain under the operational command of SAC and may be recalled to support higher-priority missions of the single integrated operations plan.<sup>11</sup>

### **Operational Employment**

The joint force commander directs the use of all forces assigned to the joint forces. In the case of air forces, the joint force commander directs tactical air missions (counterair, air interdiction, and close air support) and supporting tactical functions (reconnaissance, airlift, and special operations) by indicating the apportionment of the tactical effort devoted to each tactical mission and function.

The Air Force component commander translates the allocation apportionment into aircraft sorties. The number of aircraft sorties allocated to each tactical mission and function should be an accurate reflection of the apportionment. In the case of close air support, the appropriate component commander may distribute sorties among subordinate commanders.<sup>12</sup>

### **Principles of Command and Control**

Air Force organization for controlling air forces derives from the basic qualities of air power: flexibility, mobility, range, and speed. Since air forces can quickly bring force to cover a wide range of targets, centralized planning and control are absolutely essential to the efficient employment

of these forces. However, the myriad details of directing the actions of many widely separated units require delegation of particular tasks to subordinate echelons of command. This delegation of specialized tasks is called decentralized execution.

Essential principles of command and control in joint operations with other components are common doctrine and coordinated effort. For different military components to work effectively together, they must have a common frame of reference—joint doctrine. Additionally, they must coordinate their efforts in areas of support or potential interference, such as airspace control and electronic warfare, to name two.

The Air Force tactical air control system provides the Air Force component commander with the means to achieve these principles of command and control. As the following paragraphs describe, the tactical air control system provides for centralized planning and control while providing for decentralized execution. In addition, the tactical air control system provides the means of coordinating joint operations with other military components and supporting organizations.<sup>13</sup>

## **Tactical Air Control System**

To control assigned forces the Air Force component commander maintains a hierarchy of organizations and communications systems called the tactical air control system (TACS). The TACS includes elements to control tactical air operations, direct air defense, and manage airspace control functions. The following paragraphs describe the elements that are potentially involved in maritime operations.

### **Air Force Component Headquarters**

The component headquarters provides the staff required by the Air Force component commander for overall planning, policy-making, coordinating, and supervising the air forces. The headquarters staff develops plans and directs deployments and shifts of forces to meet changes in the tactical situation. The deputy for operations is directly responsible for day-to-day operations and is also the commander of the tactical air control center.

### **Tactical Air Control Center**

The tactical air control center is the senior element in the tactical air control system, providing detailed control of tactical air operations, air defense, airlift, and airspace management. Two important divisions of the tactical air control center are the current plans division and the current operations division. The current plans division prepares operations orders to outline short-term operations and air tasking orders to direct daily air operations. The air tasking order is the primary means of distributing instructions to subordinate (Air Force) and lateral component (Army, Navy,

and Marine Corps) headquarters. The current operations division executes the air tasking order, adapting it to changing conditions, such as mission changes, short-notice, immediate requirements, and base limitations. The tactical air control center receives liaison elements from other service components and provides liaison elements as required. The naval and amphibious liaison element monitors and interprets the naval situation at the tactical air control center.<sup>14</sup>

The tactical air control center achieves decentralized execution of tactical air operations by the use of geographically dispersed, specialized subordinate units for certain functions. The control and reporting center directs counterair operations; the airlift control center directs tactical airlift; and the air support operations center directs operations supporting the Army.<sup>15</sup>

### **Air Support Operations Center**

The air support operations center coordinates operations supporting Army commanders. Normally located at the Army corps level, the air support operations center relays support requests to the tactical air support center, coordinates airspace management, provides dedicated communications, and manages Air Force tactical air control units and forward air controllers assigned to Army units. The air support operations center is the key element in coordinating the Air Force missions of close air support and battlefield air interdiction.<sup>16</sup>

Although the tactical air support system provides an elaborate coordination system at all levels of the Army organization, no equivalent system is available to the Navy for maritime operations.<sup>17</sup> (Amphibious doctrine includes a cursory provision for elements of the Air Force tactical air control system.)<sup>18</sup> Coordination is accomplished by the Navy liaison element at the tactical air control center and any Air Force liaison elements provided to Navy organizations. However, the Air Force liaison system to the Army and the Navy are not alike.

Air Force liaison elements to Navy operational commands are limited to single liaison officers assigned to numbered fleets. Although these officers are permanently assigned to the fleet staffs, their roles are more to coordinate peacetime training and exercises than to provide operational liaison during wartime, when effective liaison would require significantly increased liaison elements. Additionally, these liaison positions do not exist at all numbered fleets, having developed on an ad hoc basis instead of being part of a standardized program.

### **Airborne Warning and Control System**

The airborne warning and control system (AWACS) provides extended radar and radio range, air defense warning, airborne control, and backup to ground radar and control systems. The E-3 AWACS aircraft extends the tactical air control system well beyond the range of ground-based systems during deployments and long-range tactical air missions.<sup>19</sup>

During maritime operations, the AWACS accompanies attacking forces to provide early warning, command and control, communications relay, and targeting. The AWACS radar detects airborne targets and surface ships well beyond the range of fighter and bomber aircraft. The AWACS radios provide adequate communications within the attacking force and with outside forces supporting or monitoring the operation.

## **Air Tasking Cycle**

The tactical air control center coordinates planning and execution of tactical air operations by the air tasking order, a message containing a detailed description of air operations, coordination details, and specific instructions for each aircraft sortie. The tactical air control center prepares the air tasking order based on air employment guidance and the apportionment decision contained in the air operations order published by the tactical air force deputy for operations.<sup>20</sup>

### **Air Tasking Order**

The tactical air control center issues a daily air tasking order to provide detailed tasking and coordination information to all assigned, tasked, and supported forces. The air tasking order may be issued for various durations, but a 24-hour duration is standard. The tactical air control center transmits the air tasking order to appropriate units by the best means, usually electronically, or by courier, if necessary. The air tasking cycle may vary depending on the conditions of the theater, but all units must receive the air tasking order with adequate time to plan missions.<sup>21</sup>

The format of the air tasking order is determined by the supported command. Communications degradation can affect the level of detail.<sup>22</sup> Although the message formats referred to in chapter 2 are standard, each command modifies the formats to fit local conditions. Factors affecting the format include communications capabilities, specialized command and control systems, and agreements with allies.

## **Summary**

This chapter described the Air Force doctrine for command and control and the implementation of this doctrine in the tactical air control system. While the dual principles of centralized planning and control and decentralized execution fit the special conditions of the Air Force, their embodiment in the tactical air control system make the resulting command and control system highly dependent on high-quality communications.

The next chapter describes the Navy's approach to the problem of command and control. As might be expected for the differences between operations in the air and at sea, the Navy has a command and control

system which is organized along very different concepts. Understanding the two different systems is the first step in bringing them together in joint operations.

#### Notes

1. Air Force Manual (AFM) 1-1, *Basic Aerospace Doctrine of the United States Air Force*, 16 March 1984, iv.
2. Ibid.
3. Ibid., 2-2.
4. Ibid., 1-3.
5. Ibid.
6. Ibid., 3-2 through 3-8.
7. AFM 2-7, *Tactical Air Force Operations—Tactical Air Control System (TACS)*, 2 February 1979, 1-1.
8. AFM 1-1, 4-2.
9. AFM 2-1, *Tactical Air Operations—Counter Air, Close Air Support, and Air Interdiction*, 2 May 1969, 1-1.
10. Tactical Air Command Regulation (TACR) 55-45, *Tactical Air Force Headquarters and the Tactical Air Control Center*, 8 April 1988, 1-1.
11. AFM 2-7, 1-1 through 1-3.
12. Ibid., 1-3.
13. Ibid., 2-1.
14. Ibid., 3-1.
15. Ibid.
16. Ibid.
17. Air Force Regulation 55-33, *Tactical Air Control Parties and Forward Air Controllers*, 1 September 1987, 1.
18. AFM 2-2, *Tactical Air Operations in Conjunction with Amphibious Operations*, 20 September 1968, 10-11.
19. AFM 2-7, 3-4.
20. TACR 55-45, 2-2.
21. Ibid., 6-1.
22. Ibid.

## Chapter 4

# Navy Command and Control

As described in chapter 3, the Air Force command and control system is organized around a concept of centralized planning and control but decentralized execution. At the heart of Air Force command and control are the tactical air control center and the air tasking order, which coordinate the execution of Air Force operations.

The Navy's command and control system is organized around the composite warfare commander concept and is based on coordinated execution of the four naval warfare tasks within the battle group. The battle group commander provides general guidance and forces to the four commanders, who develop their individual plans to accomplish each mission. The battle group commander monitors the actions of the subordinate commanders, stepping in only to correct problems or to arbitrate conflicting demands for limited resources.

To provide the background necessary to understand the composite warfare commander concept, this chapter briefly describes the fundamental characteristics of naval operations and naval warfare. These characteristics shape the organization of naval forces and affect how naval forces fit into the overall unified military command structure.

## Background

Although the Navy does not publish documents specifically designated as doctrine, it does provide a series of naval warfare publications (NWP) that describe strategy, command and control, tactics, enemy capabilities, and principles of conducting various types of warfare. This series of publications forms the basic guidance to naval commanders in operational situations.

Naval Warfare Publication 1, *Strategic Concepts of the U.S. Navy*, divides these operations into two basic functions: sea control and power projection. These two basic functions are closely interrelated because each supports the other.<sup>1</sup>

Sea control means control of the surface, subsurface, and airspace of a specific sea area of naval operations. It is achieved by destruction of enemy forces or deterrence of enemy actions. Sea control is required to ensure the logistical support required to sustain any overseas military operation, including Army or Air Force operations.<sup>2</sup>

Power projection, on the other hand, refers to supporting land or air campaigns and includes "a broad spectrum of offensive naval operations, including strategic nuclear response by fleet ballistic missile submarines, employment of carrier-based aircraft, amphibious assault forces, and naval bombardment with guns and missiles."<sup>3</sup> Naturally, sea control is an essential element of power projection. The two basic functions of naval forces are a direct result of the unique characteristics of naval forces.

The Navy's forces have several important characteristics, including wide deployment and variable response. During peacetime, 30 percent are deployed overseas and ready for immediate action, while another 40 percent are available for immediate deployment from stateside ports to areas throughout the world. Naval forces can provide a range of action from a show of force to a nuclear response.<sup>4</sup>

As a result of international conventions establishing freedom of the seas, naval forces have several advantages over other military forces. Naval forces can respond worldwide throughout the spectrum of conflict with a show of force, conventional warfare, or nuclear response. Unlike ground forces they do not require overseas bases (although these can greatly facilitate operations) or permission from foreign governments to move into an area. Compared to land-based forces, they can move quickly throughout the world and be ready when they arrive in an operations area. By means of underway replenishment, they can operate at great distances from their logistics support bases. Compared to air forces, naval forces can remain in a distant area for long periods of time.

Naval forces have the characteristic of "presence." They can demonstrate national political interest in an area just by being there. Adjustments in the size, visibility, or location of the forces can indicate the level of interest or demonstrate intent while maintaining the capability to adjust response freely to indicate changing levels of interest.<sup>5</sup>

## **Naval Warfare**

NWP 1 defines naval warfare as a "conflict in which at least one of the opponents is operating from the sea with surface ships, submarines, or sea-based aircraft."<sup>6</sup> The three naval warfare areas are surface, subsurface, and air. Since these three areas are very different, successful naval operations must integrate the three types of forces to provide mutual support and to gain advantage over enemy forces.

### **Naval Warfare Tasks**

The Navy defines the following fundamental naval warfare tasks: anti-air warfare, antisubmarine warfare, antisurface ship warfare, strike warfare, amphibious warfare, and mine warfare. Although these categories are fairly obvious, a few points of clarification are necessary. Anti-air warfare includes all air superiority measures and attacks against air vehicles, whether



launched from ship, submarine, air, or land. Strike warfare is attacking targets ashore.<sup>7</sup>

In addition to fundamental naval warfare tasks, the Navy defines the following supporting warfare tasks: special warfare; ocean surveillance; intelligence; command, control, and communications (C<sup>3</sup>); electronic warfare; and logistics. These operations support the fundamental naval warfare tasks.<sup>8</sup>

### **Tactical Force Structure**

Since the primary purpose of naval forces is sea control, each battle force is designed for the full spectrum of combat at sea. For this reason, each battle group will consist of a carrier, surface warships, and a submarine. When operating in a larger force containing a carrier battle group, a battle group can include a battleship instead of a carrier. Additional task forces may be tailored to meet specific missions by including ships with particular capabilities.<sup>9</sup>

### **Air Power**

Aircraft are an essential element of naval operations. Naval forces must deploy with organic air power because they are frequently located beyond the range of land-based aircraft. Manned aircraft are the best weapons for use against other manned aircraft and to establish local air superiority. At this time large-deck carriers provide organic air power for naval forces. However, advances in vertical and/or short takeoff and landing aircraft may provide future flexibility in flying from other types of ships.

In addition, advances in cruise missiles provide the capability to attack land and sea targets with nuclear or conventional warheads. Cruise missiles are launched from air, surface, or subsurface platforms. Current technology provides good antiship capabilities. As missile ranges increase, centralized control becomes more important, and targeting becomes more difficult.<sup>10</sup>

## **Navy Organization**

The Navy has significantly evolved from its beginnings in 1798, but its organization has retained two unique divisions—the shore establishment and operating forces—under the secretary of the Navy. Initially, the secretary of the Navy controlled the shore establishment and—less directly due to limited communications—the operating forces. As the Navy increased in size and technological complexity, in 1842 Congress added a system of bureaus for specific areas of expertise. In 1915 the position of chief of naval operations (CNO) was added to direct the operating forces and to provide a naval adviser to the secretary of the Navy. During World War II the basic organization of the Navy was changed to assign command of

the shore establishment to the CNO. In spite of these changes, the Navy has retained the differentiation between shore establishment and operating forces.<sup>11</sup> The shore establishment provides and maintains the facilities, equipment, and forces, while the operating forces conduct peacetime and wartime operational employment.

The National Security Act of 1947, as amended in 1949, assigned combatant forces (including Navy operating forces) to unified and specified commanders. For the first time, the direct chain of command from secretary of the Navy to operating forces was broken.<sup>12</sup> As described in chapter 2, this change enhanced joint operations between the forces by centralizing the direction of all forces under a single commander.

Naval operating forces include combat and combat-support forces. These forces include the Pacific and Atlantic Fleets, US Naval Forces Europe, US Forces Central Command, US Forces Southern Command, Military Sealift Command, and other organizations.<sup>13</sup> Naval Warfare Publication 2, *Organization of the U.S. Navy*, offers a detailed description of the missions and organization of the operational commands.<sup>14</sup>

## **Chain of Command**

As described earlier, the Navy maintains two separate but complementary chains of command: administrative and operational. The unified command structure requires these separate chains of command to relieve the unified commander of training and support not directly related to operational matters.

As described in chapter 2, the definitions of operational command and operational control are important for clarity. Operational command comprises "those functions of command involving the composition of subordinate forces, the assignment of tasks, the designation of objectives and the authoritative direction necessary to accomplish the mission."<sup>15</sup> It does not include such administrative functions as discipline, training, administration, or internal organization. Operational command is assigned only to unified and specified commanders. Operational control is synonymous with operational command but applies only to functions exercised by subordinate commanders.<sup>16</sup>

Since naval operating forces are assigned to the operational command of a unified or specified commander, the CNO maintains a separate administrative chain of command to perform the administrative control of Navy forces. The administrative chain of command flows from the secretary of the Navy through the CNO to the fleet commanders in chief.<sup>17</sup>

On the other hand, the operational chain of command flows from the unified or specified commander through the fleet commander in chief (as the naval component commander) to the numbered fleet commanders. Below the numbered fleet level, commands are organized by operational tasks (task force, task group, and task unit) to conduct specific broad naval

tasks.<sup>18</sup> These commands are the basic operating units of naval warfare. At this point the Navy operates in its own unique organization, the composite warfare commander concept.

## **Composite Warfare Commander**

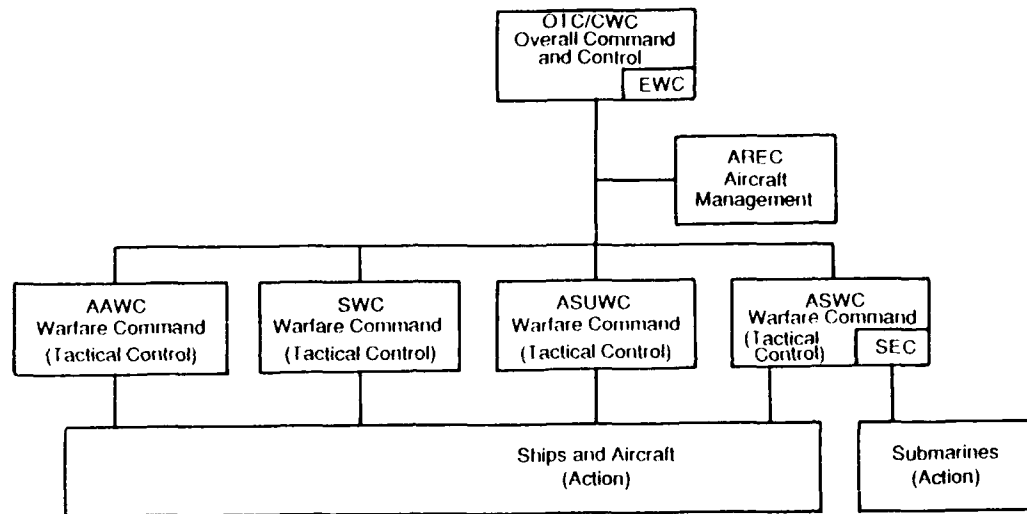
Due to the complexities of naval warfare and the various demands on the commander of a naval force, the commander must assign tasks to subordinate commanders. The Navy's basic command and control structure is the composite warfare commander (CWC) concept. Under the CWC concept the commander of a naval force assigns responsibility for each naval warfare task to a subordinate commander, who directs the actions of the naval force in that task. The commander implements parts of the CWC structure to control the force, delegating control of naval warfare tasks for more effective control of such tactical considerations as location, dispersal, emissions control, equipment, and communications capabilities.<sup>19</sup>

The following paragraphs describe the responsibilities of each position in the CWC concept. Naval Warfare Publication 10-1, *Composite Warfare Commander's Manual*, describes each aspect of the CWC concept and structure in greater detail. Figure 3 shows the relationship between elements of the composite warfare commander structure. The call signs in the naval warfare commanders section of figure 3 are commonly used to refer to the commanders.

The composite warfare commander has overall control of the forces and responsibility for mission accomplishment, assignment of forces, and safety of the force. The older term *officer in tactical control* (OTC) is synonymous with CWC. The composite warfare commander is usually located on an aircraft carrier or a cruiser.

Several coordinators provide specialized advice to the CWC. The air resource element coordinator (AREC), usually located on an aircraft carrier, advises the CWC and other commanders of the availability and employment of aircraft. The air wing commander is normally assigned as the AREC. The electronic warfare coordinator (EWC), usually assigned to the CWC staff, plans and executes electronic warfare and command, control, and communications countermeasures. The submarine element coordinator (SEC) integrates the operations of submarines operating in direct support of the naval force or operating in the same area. The SEC supports the antisubmarine warfare commander but reports directly to the CWC to ensure submarine safety or to prevent mutual interference between the naval force and submarine operating in the same area.

In addition to the CWC coordinators, four subordinate commanders direct actions in the four naval wartime tasks. These commanders are the antisubmarine warfare commander (ASWC), the antisurface warfare commander (ASUWC), the antiair warfare commander (AAWC), and the strike warfare commander (SWC). These subordinate commanders coordinate



CWC Command Structure

#### Naval Warfare Commanders

<i>Title</i>	<i>Call/Sign Designator</i>	<i>Typical Location</i>
Fleet Commander, Battle Force Commander, or Other At-Sea Commander	AA	Carrier or Landing Command Ship
Composite Warfare Commander (CWC)	AB	Carrier or Cruiser
Strike Warfare Commander (SWC)	AP	Carrier or Cruiser
Antisurface Warfare Commander (ASUWC)	AS	Carrier or Cruiser
Anti-air Warfare Commander (AAWC)	AW	Carrier or Cruiser
Antisubmarine Warfare Commander (ASWC)	AX	Carrier or Destroyer
Electronic Warfare Coordinator (EWC)	AE	Carrier or Cruiser
Air Resource Element Coordinator (AREC)	AR	Carrier
Submarine-Element Coordinator (SEC)		Carrier or Cruiser

Source: Joint Chiefs of Staff Test Publication 3-04, *Doctrine for Maritime Operations (Air)*, 1 May 1988.

Figure 3. Composite Warfare Commander Command Structure.

their warfare task operations to prevent mutual interference and to achieve the most efficient use of resources. If the subordinate commanders cannot settle differences, they refer problems to the CWC for final resolution.<sup>20</sup>

The ASWC directs antisubmarine warfare operations. This commander, usually located on a cruiser or a destroyer with its extensive antisubmarine warfare equipment and command and control facilities, directs the destroyers, patrol aircraft, submarines, and other units engaged in antisubmarine warfare.<sup>21</sup>

The AAWC directs antiair operations. This commander, usually located on a cruiser with its extensive antiair defenses and command and control facilities, coordinates fighter aircraft, airborne early warning aircraft, and air defense missiles to protect the naval force from air attack by aircraft or missiles. The AAWC coordinates use of aircraft through the AREC to minimize conflict with other subordinate commanders who need aircraft for other naval warfare tasks.<sup>22</sup>

The ASUWC directs antisurface warfare. This commander, usually located on the aircraft carrier with its extensive antisurface warfare capabilities and command and control facilities, controls aircraft, antiship missiles, and occasionally ships engaged in antisurface warfare. The ASUWC uses resources from ships under the primary control of other subordinate commanders. For example, the Harpoon and Tomahawk antiship missiles are located on cruisers and destroyers, which are primarily used in antiair warfare and antisubmarine warfare, respectively. The ASUWC must coordinate antisurface warfare actions with other subordinate commanders to prevent degradation of other warfare actions.<sup>23</sup>

The SWC directs strike warfare. This commander, usually located on the aircraft carrier with its extensive strike warfare capabilities and command and control facilities, controls aircraft and land attack missiles engaged in strike warfare. The SWC coordinates the use of aircraft with the AREC and other commanders who need aircraft for their naval warfare tasks.<sup>24</sup>

This brief summary of the subordinate commanders' duties in the CWC structure highlights the close relationship of all the naval warfare tasks and the amount of coordination required between each subordinate commander. Each commander competes for use of the same resources, especially aircraft. For example, fighter aircraft perform important roles in antiair warfare, antisurface warfare, and strike warfare. In periods of intense operations, the AAWC, the ASUWC, and the SWC must coordinate their requirements and agree on apportionment of the limited number of aircraft available. If they cannot agree on distribution of aircraft, the CWC decides the proper apportionment to each area.

### **Use of Nonorganic Forces**

Although the subordinate commanders are responsible for operations in their respective naval warfare tasks, the CWC coordinates all activities supporting or supported by nonorganic (not assigned to the naval force)

units. For air operations this includes support from land-based commanders. In both cases the CWC is the point of contact for all organizations that are not part of the naval force. All requests and taskings go through the CWC, who assigns action to the appropriate commander. In other words, outside forces, such as the Air Force, the joint task force commander, or adjacent theater commanders, contact the CWC.<sup>25</sup> This arrangement conveniently avoids confusion as to appropriate routing for requests and taskings.

## Summary

This chapter described characteristics of naval warfare and their effects as shown by naval organization, chain of command, and the composite warfare commander concept.

Naval operations have unique characteristics which affect naval warfare and naval organization. The three naval warfare areas of air, surface, and subsurface operations have vastly different requirements in equipment and training, but the successful commander must integrate all three. The composite warfare commander concept provides the organization to integrate these areas and to perform the fundamental naval warfare tasks of antiair warfare, antisubmarine warfare, antisurface warfare, and strike warfare.

Although the composite warfare commander concept provides efficient control of naval forces, joint operations require naval forces to coordinate operations with other services. Chapter 5 describes programs to improve interoperability between the Air Force and the Navy.

## Notes

1. Naval Warfare Publication (NWP) 1, *Strategic Concepts of the U.S. Navy*, Revision A, May 1987, I-3-2.
2. Ibid.
3. Ibid.
4. Ibid., I-3-1 through I-3-4.
5. Ibid.
6. Ibid., I-4-2.
7. Ibid., I-4-2 through I-4-4.
8. Ibid.
9. Ibid., I-4-5.
10. Ibid., I-4-9 through I-4-10.
11. NWP 2, *Organization of the U.S. Navy*, Revision C, March 1985, 2-1 through 2-2.
12. Ibid., 3-1.
13. Ibid., 3-3.
14. Ibid.
15. Ibid., 1-2.
16. Ibid.
17. Ibid.

18. Ibid., 4-2 through 5-4.
19. Joint Chiefs of Staff Test Publication 3-04, *Doctrine for Joint Maritime Operations* (Air), 1 May 1988, A-1 through A-5.
20. Ibid.
21. Ibid.
22. Ibid.
23. Ibid.
24. Ibid.
25. Ibid.

## **Chapter 5**

# **Joint Air Force and Navy Programs**

The last three chapters described command and control doctrine from the points of view of the Joint Chiefs of Staff, the Air Force, and the Navy. All three points of view agree that the joint force commander directs the actions of the joint force, while in most situations the service component commanders direct their own component forces through established component command and control systems. However, the Air Force and the Navy have very different command and control procedures, which reflect the different environments of the two services and were developed in isolation from each other. A major hurdle in conducting effective joint antiship operations is finding common ground between the Air Force and the Navy approaches to command and control.

This chapter describes current programs that attempt to reconcile differences between the command and control systems of the Air Force and the Navy and between the tactical doctrine of the two services. These programs fall into several categories. The category of interservice planning includes making agreements and developing coordinated tactics and procedures. The category of training includes ongoing operations and individual exercises to train personnel and to test tactics and procedures. Finally, the category of liaison programs includes efforts to provide a permanent interservice presence at various levels of command.

## **Interservice Agreements**

The Air Force and the Navy have indicated their intentions to increase interoperability and improve multiservice operations in a variety of documents, including memoranda of understanding, memoranda of agreement, and mutually produced or parallel tactics and procedures. The memoranda of understanding cover training, mining, aerial refueling, AWACS operations, and Harpoon employment. More detailed documents cover tasking and employment of B-52s, aerial refueling, and AWACS in maritime operations.



## **Interservice Memoranda**

In 1982 the Air Force and the Navy signed a Memorandum of Agreement to enhance Air Force contributions to maritime operations. This agreement pledged the two service components to increase interservice training in exercises, on ranges, at tactical schools, and in cross-training combat crew members. The services also agreed to improve tactics for maritime operations and to introduce joint maritime war-fighting concepts to the commanders of the combatant commands and to the Joint Chiefs of Staff for evaluation. The services also agreed to coordinate force planning for mutual reinforcement.<sup>1</sup>

According to Adm James D. Watkins, chief of naval operations, this agreement

accelerated such ongoing efforts as routinely, including Air Force units in fleet exercises, developing doctrine and procedures for employment of AWACS and B-52s in maritime missions, and identifying aerial refueling requirements. It also led to several new initiatives such as data link and communications interoperability and joint air combat training ranges.<sup>2</sup>

A subsequent agreement between the Department of the Navy and the Department of the Air Force supported efforts for enhancement of joint cooperation. Specific areas of improvement included exercises, communications equipment and procedures, combat crew member exchanges, and interservice use of tactical weapons.<sup>3</sup>

The spirit of these two agreements is evident in several other memoranda covering cooperation between the Air Force and the Navy in specific types of operations relating to antiship operations. These agreements concern the E-3 AWACS,<sup>4</sup> aerial refueling,<sup>5</sup> B-52 mining,<sup>6</sup> and B-52 Harpoon employment.<sup>7</sup>

## **Tactics and Procedures**

From the general guidelines of service-level agreements, the Air Force and the Navy have developed tactics and command and control procedures for antiship operations. Although the Air Force and Navy generally do not publish their procedures together, the separate service documents present mutually agreed-upon procedures.

On the Air Force side, the Strategic Air Command presents B-52 procedures for Harpoon antiship missile operations in Strategic Air Command Manual 3-1, *Mission Employment Tactics*, vol. 5, *B-52 Tactics*. This manual contains coordinated multiservice tactics, taskings, and command and control procedures for operations with the Navy.<sup>8</sup>

On the Navy side, the same B-52 procedures are described in a combined tactical memorandum from Second Fleet and Third Fleet with the subject, Joint Land-Based Air Antisurface Warfare Operations. This document describes identical procedures for tasking Navy P-3 aircraft and Air Force B-52 aircraft when employing the Harpoon antiship missile. In both cases, the Navy tasks missions and provides command and control instructions

by a message in the "Turquoise" format which also includes procedures for requesting Air Force AWACS support in antisurface warfare and Air Force land-based tanker aircraft in aerial refueling.<sup>9</sup>

## **Training**

Moving a step beyond agreements and procedures, Air Force and Navy personnel participate in joint maritime training operations which test procedures and equipment. Ongoing operations provide daily opportunities for contact between personnel of both services. Exercises provide more formal opportunities to evaluate levels of training and command and control capabilities.

### **Ongoing Operations**

On the Air Force side of joint antiship operations, the B-52 is the most active with training in sea-lane surveillance and reconnaissance, mining, and Harpoon missile training, while in 1988 F-16 aircrews began limited interservice tests of Harpoon tactics and procedures. The aircrews train in ship recognition, rules of engagement, naval gun and missile capabilities, electronic countermeasures, and command and control procedures.<sup>10</sup>

Under the Busy Observer program, B-52 aircrews conduct sea-lane surveillance and reconnaissance against Navy and foreign ships. With the Navy as an opposing force, the bombers search for battle groups and identify the individual ships using multi-aircraft formations to provide mutual support and protection. This type of mission provides tactical training to both Air Force and Navy participants.<sup>11</sup> When the targets are foreign naval vessels, Air Force and Navy participants test interservice tactics, communications, and interoperability.

Under the aerial mining agreement, B-52 aircrews deliver sea mines provided by Navy resupply units. When coordinated with Navy operations, B-52 mining controls surface and subsurface movement through choke points and increases the effectiveness of naval S-3 and P-3 aircraft hunting submarines.<sup>12</sup> An additional benefit of B-52 aerial mining is the training provided to Navy minesweeping units, which clear mines dropped by the aircraft.<sup>13</sup>

Under the enhancement of Air Force maritime operations agreement, B-52 aircrews train with Navy and British units to perfect antisurface warfare tactics. Since 1983 the Strategic Air Command has developed a credible antisurface warfare capability with B-52 aircraft modified to carry the Harpoon antiship missile. Currently a squadron at Loring AFB, Maine; Mather AFB, California; Barksdale AFB, Louisiana; and Andersen AFB, Guam, have Harpoon capabilities. Aircrews train regularly in maritime operations and frequently participate in joint exercises with the Navy.<sup>14</sup>

On the tactical side, Pacific Air Forces is working to provide Harpoon capability to the F-16 aircraft. On the hardware side of providing this capability, several options are under consideration. On the procedures side, the Pacific Air Forces and the Pacific Fleet began negotiation in 1988 on an agreement to provide Navy Harpoon missiles to Air Force aircraft when directed by the unified commander.<sup>15</sup>

Although use of the F-16 as a Harpoon carrier in joint antiship operations with the Navy is in the earliest stages of development, the Navy P-3 and the Air Force B-52 armed with Harpoon missiles are a potent force as a hunter-killer team in antisurface warfare. The P-3, with 150-nautical-mile-range search radar, augmented by inverse synthetic aperture radar in some aircraft, can find and identify targets beyond the range of defensive missiles. The B-52 provides the firepower to attack any potential ship target. Communications compatibility of the two aircraft types includes high frequency and ultrahigh frequency radios. In addition, the B-52 has the Air Force satellite communication system, a system not available to the P-3.<sup>16</sup>

## **Planning**

Three joint and multiservice planning efforts are under way to consider aspects of command and control of antiship operations. First, the Air Land Force Application Agency, previously an Air Force and Army effort, began planning with the Navy in 1984. Second, the Joint Tactical Command, Control, and Communications Agency is studying the communications required for maritime operations. Finally, the Office of the Secretary of Defense is funding a joint over-the-horizon targeting program. The following paragraphs describe these programs.<sup>17</sup>

### **Air Land Force Application Agency**

The Air Land Force Application Agency, originally sponsored by the Air Force's Tactical Air Command and the Army's Training and Doctrine Command, contacted the Navy's Atlantic Fleet in 1984. In 1985 the chief of naval operations directed the Atlantic Fleet to represent the entire Navy during discussions with the ALFA. Upon the direction of the Joint Actions Steering Committee, composed of a general officer from each service, the Air Land Force Application Agency initiates studies into multiservice interoperability. Upon approval of a study of two service components, the study may become a multiservice agreement and further be considered as the basis of joint doctrine. Reflecting the agency's origin, currently approved studies concern Air Force and Army interoperability problems. Although ALFA is permanently assigned only Air Force and Army representatives, the Atlantic Fleet provides a permanent point of contact and additional, temporary representation for studies when appropriate. Air Land Force Application Agency projects involving Air Force and Navy interoperability cover a

wide range of topics, including suppression of enemy air defenses, combat search and rescue, radar-beacon operations, firepower application, and laser-target designation. As a tactically oriented organization, the agency develops procedures for use at the operator level.<sup>18</sup>

### **Joint Tactical Command, Control, and Communications Agency**

A function of the Defense Communications Agency investigating inter-service communications compatibility, the Joint Tactical Command, Control, and Communications Agency is studying the tactical communications architecture for maritime operations. Upon completion, this study will outline communications requirements, existing connectivity, and shortfalls to guide future upgrades and system development. The areas of study include descriptions of maritime warfare functions, relevant joint and service doctrine, information flow to support operations, communications equipment to support joint interfaces, and information flow supported by standard message text formats.<sup>19</sup>

The final draft to this report identifies several problem areas in joint antisurface warfare. First, joint doctrine for antisurface warfare lacks detail, providing general guidance but neither specifying joint operating procedures for aircraft conducting antisurface warfare nor describing procedures for requesting and coordinating joint operations. Second, Air Force strike aircraft do not have the tactical digital information links (TADIL A, or the upcoming TADIL J) system used by the Navy for command and control. Third, procedures for operation of communications equipment are absent, although the equipment is technically compatible. The time-sensitive nature of antisurface warfare requires procedures on hand for the communications to be effective. Finally, the report recommends development of standard procedures for data exchange as a supplement to existing voice and message systems.<sup>20</sup>

### **Joint Over-the-Horizon Targeting Feasibility Study**

In November 1988 the Joint Chiefs of Staff announced a joint over-the-horizon targeting (JOTH-T) interoperability study to improve use of joint and national assets in over-the-horizon targeting and weapons delivery. Known as the JOTH-T, this program will "provide a consistent tactical data picture for decision makers at all levels and improve joint interoperability."<sup>21</sup> The program began with a six-month feasibility study to be followed by a three-year test under the auspices of the Navy Space and Naval Warfare Systems Command with support from each of the services. This program could enhance command and control of joint antiship operations by identifying areas to improve interoperability and to increase targeting range.<sup>22</sup>

## **Liaison Programs**

Liaison programs between the Air Force and the Navy are a patchwork of permanent and temporary positions. The permanent positions provide ongoing liaison to specific headquarters. The temporary positions provide liaison for exercises or contingency operations which require more support.

### **Permanent Liaison Positions**

Several permanent liaison positions exist at Air Force and Navy headquarters. The personnel assigned to these positions assist in planning exercises and operations involving their parent service. Distribution of liaison positions does not follow a consistent pattern, indicating that the positions were created in response to specific requirements instead of broader, servicewide requirements.

The Air Force provides liaison officers in the rank of lieutenant colonel for some of the numbered fleets. In the Atlantic Ocean, the Second Fleet has a liaison officer with a Strategic Air Command background, reflecting the extensive coordination accomplished in the areas of sea surveillance and antiship operations. In the western Pacific Ocean and Indian Ocean, the Seventh Fleet has a liaison position, also for an officer with a strategic background. Originally, this position was created for an officer with a tactical background provided from the Fifth Air Force, a subordinate of the Pacific Air Forces, the tactical arm of the Air Force in the Pacific Ocean. In the eastern Pacific Ocean, the Third Fleet does not have an Air Force liaison officer. In the Mediterranean Sea the Sixth Fleet has a liaison position, which is currently vacant. The Air Force does not provide permanent liaison officers to lower levels, such as carrier groups or cruiser-destroyer groups.<sup>23</sup>

The Navy provides an equally small number of liaison positions to the Air Force. At Headquarters Strategic Air Command, a Navy lieutenant provides expertise in mining. At the 552d Airborne Warning and Control Division, a three-person Navy liaison detachment provides training and planning expertise to coordinate E-3 airborne warning and control operations with the Navy. The headquarters of the Tactical Air Command, Pacific Air Forces, and United States Air Forces in Europe do not have Navy liaison officers.<sup>24</sup>

### **Temporary Liaison Elements**

In addition to the permanent liaison positions described above, the Air Force and the Navy provide temporary liaison elements for interservice coordination during exercises or contingency operations. The size and composition of these elements are tailored to fit the operations and levels of command. Usually the headquarters providing the liaison element assembles and trains personnel for each operation. However, two standing organizations are exceptions to this process.

The Seventh Fleet Coordinating Group provides the nucleus for liaison elements from the Seventh Fleet to other organizations. During field training

exercises and command post exercises, this group sends representatives to Air Force, Army, or joint headquarters to provide a variety of liaison functions. However, the group's small size limits its capabilities.

The Strategic Air Command provides an advanced echelon (ADVON) to headquarters and planning elements to provide planning and employment assistance to joint or service commanders unfamiliar with bomber and tanker operations. Strategic Air Command Manual 3-1 provides a detailed description of the operation, composition, and capabilities of the advanced echelon.<sup>25</sup>

## Summary

This chapter described current programs affecting the command and control of joint antiship operations. These programs range from coordination at the joint force and component levels to tactics and communications problems between aircraft and ships. Although tremendous improvements in joint antiship capabilities have occurred, especially between the B-52 community and the Navy, problem areas still limit the effectiveness of joint antiship operations.

Next, chapter 6 draws conclusions concerning command and control systems and interoperability between the services. Based on these conclusions chapter 6 recommends changes and improvements that will increase the capability of the Air Force and the Navy to work together as an effective antiship team.

## Notes

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## **Chapter 6**

# **Conclusions and Recommendations**

This chapter analyzes the various doctrines and service programs for the command and control of joint Air Force and Navy antiship operations and recommends improvements. Implementing these recommendations will require modification in the way we, the Air Force and Navy personnel involved in joint operations, think. If we are going to fight jointly, we must think jointly in our daily activities, in our planning, and in our exercise and combat activities.

These changes will require sincere efforts on the part of each participant in the planning and execution process. We have to overcome parochial service attitudes we have developed during times of independent operations. We must adapt our attitudes and expand our horizons to understand the unique requirements of each service. Our schools must adapt curricula to include this new spirit of jointness, and our leaders must honestly endorse these new cooperative efforts. Only through a change of attitude can we work as a team.

Enough of the philosophy. The following discussion begins at the headquarters level and goes on to distill procedures, identify equipment outlines, and focus on training concerns.

## **Headquarters**

Command and control boils down to coordination between members of the various headquarters. An effective command and control arrangement allows members of one headquarters to coordinate with members of another headquarters. The best way to achieve this coordination is to assign personnel to the staff of the other's headquarters. As described in chapter 5, the Air Force and the Navy provide a system of liaison officers and elements between various levels of command. The following paragraphs draw conclusions on the effectiveness of this system and recommend improvements.

### **Liaison Officers**

In comparison to the liaison officer system between the Air Force and the Army, the liaison system between the Air Force and the Navy is almost



nonexistent. The increasing emphasis on joint air operations in the maritime environment requires an acceleration in planning and coordinating between the Air Force and the Navy, increasing the requirement for liaison officers.

### **Coordination Elements**

A limited network of liaison officers is adequate for peacetime planning and training, but a much more substantial organization is necessary for large-scale exercises and combat operations. As described in chapter 5, the Strategic Air Command's advanced echelon and the Seventh Fleet's coordinating group provide planning and coordination assistance during increased operations. Other coordination elements are provided, as required. However, these other elements are composed of personnel drawn together from scattered locations and are not standing organizations. These coordination elements require a period of time to organize themselves and to contact appropriate levels of command and control.

Recommendation: The Air Force and the Navy should increase peacetime and contingency liaison elements. Locations requiring peacetime liaison officers include Air Force major commands (Tactical Air Command, Strategic Air Command, Pacific Air Forces, and United States Air Forces in Europe), the Atlantic and Pacific Fleets, numbered air forces, numbered fleets, and select cruiser-destroyer and carrier groups. Exercise and contingency liaison elements should provide increased presence at the same locations, especially at tactical air control centers and numbered fleets involved in joint operations.

### **Joint Forces Air Component Commander**

As discussed in chapter 2, the joint forces air component commander is a level of coordination over the service component commanders. In the case of Air Force and Navy joint operations, the JFACC is a viable and appropriate concept. However, the term *commander* is a misnomer as currently defined.

Calling the JFACC a commander implies another layer of command above the Air Force and the Navy component commanders for specific segments of air operations. This structure is not the purpose of the joint doctrine that describes joint forces command and control. The joint forces air component commander functions as a coordinator except in the case where the joint forces commander decides to organize assigned forces along functional lines. Although the Air Force advocates organization along functional lines, simplicity and existing command arrangements usually dictate organization along service component lines. For these reasons, the joint forces air component commander is more appropriately called coordinator instead of commander.

Recommendation: Rename the function of joint forces air component commander to joint forces air component coordinator.

## **Procedures**

Current Air Force and Navy procedures do not support effective command and control of joint maritime air operations. In some cases, the procedures are under development; but in other cases the procedures are deeply entrenched in operations of the separate services. As worldwide forces, the Air Force and the Navy require procedures which remain consistent throughout all theaters.

### **Joint Doctrine Development**

The Joint Doctrine Center and the Air Land Force Application Agency are both responsible for development of doctrine for the operations of the Air Force and the Navy. Although the Joint Doctrine Center is responsible for more general guidance, and the Air Land Force Application Agency is responsible for more specific tactical guidance, both units provide very similar products. Combining the two units would increase their efficiency.

Recommendation: The Joint Doctrine Center should assume control of agencies producing joint doctrine.

### **Composite Warfare Commander Concept**

A major difficulty between the Air Force's way of command and control and the Navy's way lies in the dispersed nature of command in the Navy's composite warfare commander concept. By spreading the command and control of air power among the different commanders for antiair, antisubmarine, antisurface, and strike warfare, the Navy presents the Air Force with uncertainty as to who is in charge of air operations. The Navy must reduce this uncertainty and reduce coordination difficulties when the Air Force supports the Navy with air operations.

Recommendation: The Navy should provide the Air Force a single point of contact to coordinate taskings and operations.

### **Air Force Planning**

Occasionally, the Air Force also presents the Navy with uncertainty as to who is in charge. During exercise planning, the tactical air forces, the Strategic Air Command, and the Military Airlift Command each represents its own area of operations, with no single person responsible for the entire Air Force planning effort. Although subject matter experts are essential to the planning process, a single person must be responsible for coordinating the overall effort. This problem also arises in a joint command structure when airlift and strategic forces are supporting operations.

Recommendation: The Air Force should designate a single point of contact for exercise and contingency planning and operations.

## **Employment Procedures**

The Air Force and the Navy require compatible command and control procedures for employing Air Force offensive systems in the maritime environment. At the present time, these procedures are more advanced for AWACS and B-52 operations. The Air Force is just beginning to develop capabilities for joint maritime air operations by its tactical forces. For simplicity's sake, Navy procedures should be the model for Air Force procedures. Additionally, the procedures should be the same throughout the Air Force. The existing memorandum allowing the Navy to supply Harpoons to the Air Force for B-52s provides a model for supplying Harpoons to tactical aircraft.

Recommendation: The Air Force and the Navy should develop standard joint antiship procedures for tactical aircraft. As a first step, the services should require a fundamental agreement along the lines of the B-52 antisurface warfare agreement. Based on this agreement, the services should develop joint procedures and incorporate them into the appropriate tactical manuals.

## **Air Tasking Order**

The lack of standardization of air tasking order format is a source of confusion to forces moving between commands as is the case with Air Force augmenting forces and Navy fleets which operate in support of several joint commands. As described in chapter 3, the air tasking order format varies between theaters depending on the requirements of each joint commander.

The Air Force and the Navy require a mutually acceptable air tasking order format for directing maritime air operations. A mutually acceptable format has three critical characteristics. First, the format must be short to accommodate the limited capacity of shipborne communications. Units do not need the entire air tasking order, only what is required for their operations. Second, the format must be compatible with the air tasking formats described in Joint Chiefs of Staff Publication 3-56.24, *Tactical Command and Control Planning Guidance and Procedures for Joint Operations, Joint Interface Operational Procedures—Message Text Formats*, to fit the standard Air Force air tasking order. Finally, the format must provide for periods when the Navy will not transmit during emission control conditions (i.e., the air tasking order must provide operational continuity when two-way coordination is suspended).

Recommendation: The Air Force should develop a standard air tasking order format for use worldwide.

## **Equipment**

The first part of this chapter discussed the software of controlling joint maritime air operations, liaison elements, procedures, and air tasking

orders. The next part will discuss the hardware, that is, communications equipment. Existing equipment provides limited capabilities in joint operations, but the following areas require more attention.

### **Aircraft Radios**

Navy and Air Force aircraft radios must be able to communicate with each other. As discussed in chapter 5, the major incompatibility in aircraft radios is the Navy's lack of Have Quick antijam radios, an essential element for Air Force command and control in a communications jamming environment.

Recommendation: The Navy should provide Have Quick-compatible radios for its aircraft and controlling agencies.

## **Joint Training**

Finally, this chapter discusses the application of joint doctrine, tactics, and procedures and the use of command and control equipment in joint maritime air operations. Successful command and control requires training the liaison elements, combat operations staffs, and aircrews who perform these missions.

### **Liaison Elements and Combat Staffs**

Frequent practice is the key to proficiency. Liaison elements should exercise regularly with their respective headquarters and combat operations staffs. Liaison elements must be composed of personnel assigned to this task for a sufficient period for training and proficiency. In other words, personnel must be assigned to the liaison element far enough in advance to receive training and must expect to remain a member of the liaison element long enough to become knowledgeable in the assignment. Large-scale command post exercises offer the most thorough opportunities to practice actual combat command and control procedures. However, all levels of command must be involved. Actual flying exercises complement the command post exercises by allowing the use of airborne communications links and control personnel as well as aircraft. Effective exercises require realistic situations to test all aspects of command and control, decision making, tasking, command arrangements, and communications.

### **Aircrews**

Aircrews require training in the specialized maritime missions. Harpoon-qualified units must exercise frequently with Navy task forces to perfect targeting, support, and tactical procedures required for accurate and survivable missile delivery. Mining procedures must be practiced to perfect the navigation and delivery procedures required to lay accurate mine patterns in coordination with other aircraft.

Recommendation: Air Force and Navy personnel should train in joint operations. Aircrews should practice joint operations to gain and maintain proficiency. Liaison and battle staff personnel should be assigned to their positions long enough to become proficient and frequently exercise to maintain proficiency.

## Summary

The conclusions and recommendations outlined in this chapter provide the basis for improving command and control of joint antiship operations between the Air Force and the Navy.

Implementing these recommendations requires support throughout the command structures of both services—from the aircrew and controller executing the missions to the planners developing plans and budgets. We must change our parochial ways of thinking and begin to incorporate both services into our plans. We must plan and practice together.

The organizational changes recommended in this study are minor, consisting of liaison elements at various headquarters and adding a few training courses for indoctrination of combat staffs. By moving a few manpower positions, the personnel are available for the new liaison positions.

The standard air tasking order is an essential step toward worldwide operations, maritime or otherwise. Navy and Air Force augmentation forces will benefit from a standard air tasking order format.

Compatible communications are an essential element in command and control of joint operations. Existing systems must be modified or replaced by systems that work together.

In summary, joint antiship operations are only a small part of the overall problem of joint operations. The recommendations to improve antiship operations will benefit all joint operations between the Air Force and the Navy.